

TECHNICAL MANUAL

AVIATION-CREW SYSTEMS

SPECIAL MISSION AIRCREW EQUIPMENT

N68936-04-D-0008

**This manual update includes Basic, dated 15 September 1999, thru
Change 5, dated 1 August 2004.**

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LIST OF EFFECTIVE PAGES

Insert latest changed pages; dispose of superseded pages in accordance with applicable regulations.

NOTE: On a changed page, the portion of the text affected by the latest change is indicated by a vertical line, or other change symbol, in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Dates of issue for original and changed pages are:

Original	15 Sep 1999	Change 3	1 Jun 2003	Change 5	1 Aug 2004
(Incl prev incorp IRACs 1 and 2)		(Incorp IRACs 4 and 5)			
Change 1	1 Dec 2000	Change 4	1 Jan 2004		
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The major changes from this change are:

1. Incorporation of Aircraft Accident Report Inspection.
2. Addition of GTS Cable Tie Tool.
3. Miscellaneous changes.
4. Addition of Chapter 9 CMU-23A/P Survival Vest, P/N 1774AS300-1.
5. Addition of Chapter 10 CMU-29(V)2/P CBR Overvest.

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A Change 5

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CHAPTER 1

INTRODUCTION

1-1. GENERAL.

WARNING

Unauthorized modification to, and deviations from, prescribed life support and survival equipment by individual crewmen could create unknown safety hazards. The OP-NAVINST 3710.7 Series specifies minimum requirements for such equipment and is supplemented by the individual model NATOPS.

1-2. The OPNAVINST 4790.2 Series identifies NAV-AIRSYSCOM as the only authority for modification to life support and survival equipment, which is usually accomplished by the Fleet Support Team (FST) (formerly Cognizant Field Activity (CFA)) via Aircrew System Changes or a change to the equipment procurement package. This manual also permits an operating activity, with approval of the controlling custodian, to conditionally modify ONE unit of equipment in-service in order to correct or overcome unsatisfactory conditions in that equipment item. Any other type of deviation, peculiar configuration, or modification to life support and survival equipment is not allowed, and Aircrew Survival Equipmentmen have no authority or responsibility to perform them.

1-3. If an omission or conflict should occur between FST documents and NATOPS requirements, if there is a need for clarification of equipment configuration, or if equipment deficiencies are discovered, the applicable FST should be notified. The FST for Life Support and Survival Equipment is Naval Air Warfare Center Aircraft Division (NAWCAD) Code 4.6.2.2, NAS Patuxent River, MD, 20670-5304. For parachutes and related hardware, including torso harnesses, the FST is the Naval Air Warfare Center Weapons Division, Code 463000D, China Lake, CA, 93555.

1-4. NAWCAD DET, Indianapolis, IN 46219, has cognizance over all survival radios and emergency beacons.

1-5. The Aviation-Crew Systems manual is released under the authority of the Naval Air Systems Command in compliance with the request of the Chief of Naval Operations. The instructions contained herein are mandatory. This manual consists of separately bound volumes, as listed below:

TITLE	PUBLICATION NUMBER
Inflatable Survival Equipment (Liferafts)	NAVAIR 13-1-6.1-1
Inflatable Survival Equipment (Life Preservers)	NAVAIR 13-1-6.1-2
Parachutes	NAVAIR 13-1-6.2
Seat Survival Kits (Oxygen Hoses and Non-SKU Seat Kits)	NAVAIR 13-1-6.3-1
Seat Survival Kits (SKU Series Seat Kits)	NAVAIR 13-1-6.3-2
Oxygen Equipment (Aircraft Equipment, Masks, and Other Systems)	NAVAIR 13-1-6.4-1
Oxygen Equipment (Regulators)	NAVAIR 13-1-6.4-2
Oxygen Equipment (Concentrators)	NAVAIR 13-1-6.4-3
Oxygen Equipment (Converters)	NAVAIR 13-1-6.4-4
Rescue and Survival Equipment	NAVAIR 13-1-6.5
Aircrew Personal Protective Equipment (Aircrew/Passenger Equipment)	NAVAIR 13-1-6.7-1
Aircrew Personal Protective Equipment (Clothing)	NAVAIR 13-1-6.7-2
Aircrew Personal Protective Equipment (Helmets and Masks)	NAVAIR 13-1-6.7-3
Aircrew Personal Protective Equipment (Protective Assembly, Aircrew Survival - Armor)	NAVAIR 13-1-6.7-4
Special Missions Aircrew Equipment	NAVAIR 13-1-6.10

NAVAIR 13-1-6.10

1-6. The purpose of this volume is to provide technical information related to the configuration, application, function, inspection, and maintenance of a particular category of aircrew safety and survival equipment. The information contained in each volume is intended for Organizational, Intermediate, and Depot Levels of maintenance as established within the Naval Aviation Maintenance Program (OPNAVINST 4790.2 Series).

1-7. DESCRIPTION OF NAVAIR 13-1-6.10.

1-8. CONTENTS. This volume contains information on configuration, application, function, inspection, and maintenance of special mission aircrew equipment.

1-9. CONFLICTS AND SUPERSEDURES. This volume shall take precedence over all other documents except for effective related Aircrew System Bulletins and Changes, and Interim Aircrew System Bulletins and Changes. These documents are effective until officially rescinded, canceled, or superseded.

1-10. The modifications section of each chapter lists all effective changes which affect Aircrew Personal Protective Equipment and have been issued on or before the date of latest change or revision to this volume. When applicable, the subject matter of these documents has been incorporated within the text of the appropriate chapters.

1-11. Effective changes and bulletins which effect Aircrew Personal Protective Equipment and are issued between changes and revisions to this volume should be recorded in the modification section of the manual for the affected equipment by annotating the outer margin of the page with a vertical line and the number of the change or bulletin. A copy of the change or bulletin should be filed in a separate binder in the ALSS work center. When this volume is updated these documents will be listed in the modification sections of the applicable chapters and the text of the chapters will be updated to reflect the changes and bulletins.

1-12. UPDATING. These volumes will be updated periodically by the issuance of a revision, which is a 100 percent replacement of pages. Between revisions, changes and rapid action changes will be released, which are partial replacement of pages. All added and changed pages shall be incorporated in these volumes according to page number. Superseded and deleted pages shall be discarded in accordance with the local security procedures for data containing distribution statements. A list of effective pages is

provided with each change. A summary of the major changed areas for a particular change or revision is located directly beneath the list of effective pages.

1-13. COMMENTS AND RECOMMENDATIONS. Comments and recommendations shall be submitted using established deficiency reporting systems in accordance with OPNAVINST 4790.2 Series.

1-14. ENGINEERING DRAWINGS. Government engineering drawings are available to the fleet by submitting a letter of request to Commanding Officer, Naval Air Technical Data and Engineering Service Command, Naval Air Station North Island, P.O. Box 357031, Building 90 Distribution, San Diego, CA 92135-7031. Each request should include the equipment nomenclature, part number, and CAGE code. The drawings will be provided in the form of aperture cards (Automatic Data Processing Punch Cards). Technical data may also be obtained online at the NATEC website located at <http://www.natec.navy.mil>. Authorized users must first establish an account prior to obtaining data. Access/account information can be obtained at the NATEC website.

1-15. TECHNICAL DIRECTIVES AND FORMS. NATEC is the central management activity for aeronautical technical publications, engineering drawings and associated technical services. Upon release, NATEC will forward to all designated activities, copies of Technical Directives and Forms. Additional copies are available utilizing the procedures shown in paragraph 1-14 as well as from the PMA-202 website at <https://pma202.navair.navy.mil>.

1-16. QUALITY ASSURANCE. Quality assurance steps are provided for critical operations. When a step is underlined, the Aircrew Survival Equipmentman shall perform the operation and then have performance verified by a Collateral Duty Inspection (CDI-CDQAR-QAR) as established within the Naval Aviation Maintenance Program (OPNAVINST 4790.2 Series) prior to proceeding to the next operation. In no case shall an Aircrew Survival Equipmentman perform his/her own quality assurance inspection.

1-17. ALLOWANCE LISTING OF SPECIAL MISSION AIRCREW EQUIPMENT.

1-18. NAVAIR 00-35QH-2 and NAVAIR 00-35QH-3 establish the allowance listing for special mission aircrew equipment. The allowance is generally determined by the number of crewmember seats (stations) aboard the aircraft. A specific spare allowance is provided for extra flight crew requirements, assemblies down for rework, awaiting replacement units and inspection cycle spares.

1-19. LEVELS OF MAINTENANCE.

1-20. Maintenance, inspection, repair, and overhaul shall be performed at the established level of maintenance in accordance with and as defined in OPNAVINST 4790.2 Series. In cases of necessity, such as at very small activities, Organizational and Intermediate Levels may be combined within local capabilities. It is recognized that, due to conditions other than those assumed here, minor deviations to procedures outlined in this manual may be unavoidable. Prior to forwarding to a depot facility, it shall be definitely determined that maintenance cannot be performed at a lower level.

1-21. SUPPLEMENTARY PUBLICATIONS.

1-22. In addition to Interim Aircrew System Bulletins and Changes, and Aircrew System Bulletins and Changes which are still in effect, the following publications supplement this volume.

1. NAVAIR 00-35QH-2, Allowance List, Aviation Life Support System and Airborne Operation Equipment for Aircraft Squadrons Navy and Marine Corps.

2. OPNAV INSTRUCTION 4790.2 (Series). The Naval Aviation Maintenance Program.

3. OPNAVINST 4410.2A

4. OPNAV INSTRUCTION 3710.7 provides general instructions on required minimums for aircrew personal protective equipment.

5. The applicable NATOPS Flight Manual and Aircraft Maintenance Instruction Manuals.

6. NAVSUP PUBLICATION 2002.

7. NAVAIR 13-1-6.8 Aviation Crew Systems Work Unit Code Manual.

8. NAVAIR 01-1A-509 Cleaning and Corrosion Organizational and Intermediate Maintenance.

9. U.S. Navy CBR Defense/U.S. Marine Corps NBC Defense Handbook (OPNAV P-86-1-95).

10. Naval Aviation, Nuclear, Biological and Chemical (NBC) Defense Resource Manual (NAVAIR A1-NBCDR-OPM-000).

11. NAVSUPINST 4423.29 (Series). Naval Material Command (NMC) Uniform Source, Maintenance, and Recoverability (SM&R) Codes.

12. NAVSUP P-719 Guide for the Assignment and Use of Source, Maintenance, and Recoverability (SM&R) Codes.

1-23. DEFINITIONS.

1-24. The following is a list of definitions used in this volume.

WARNING

Indicates danger to personnel. The warning precedes the item to which it refers.

CAUTION

Indicates danger to the equipment. The caution precedes the item to which it refers.

NOTE

An information item. The note may precede or follow the item to which it refers.

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CHAPTER 2

MAINTENANCE CONCEPTS, SCHEDULING, AND DOCUMENTATION

Section 2-1. Maintenance Concepts

2-1. GENERAL.

2-2. NAVAL AVIATION MAINTENANCE PROGRAM. All maintenance and inspection actions upon Aviation Life Support Systems (ALSS) equipment shall be made as part of the Naval Aviation Maintenance Program in accordance with OPNAVINST 4790.2 Series.

2-3. LEVELS OF MAINTENANCE. Maintenance of ALSS equipment shall be performed at the established level of maintenance in accordance with OPNAVINST 4790.2 Series.

2-4. QUALIFIED PERSONNEL. Refer to OPNAVINST 4790.2 Series for qualifications of personnel authorized to perform maintenance actions on ALSS equipment.

2-5. STORAGE. During storage, the A/P22P-14(V) Series respirators will remain in a aluminium foil laminate vapor proof barrier bag that has been partially vacuum packed, and then heat sealed to provide maximum shelf life protection for the natural and synthetic rubber components. Desiccant packs are also placed inside the foil bags. The A/P23P-14A(V) respirator assemblies have been packaged in the same manner using plastic bags rather than aluminium foil bags. If any bags require replacing, then the foil bags should be used. It is intended that only a small quantity of respirators will be opened and used for in-flight proficiency training or for compiling aircrew fitting measurements. As long as the respirators remain vacuum sealed in their foil bags, there is no requirement to perform the Place-In-Service Inspection or the periodic Calendar Inspections. If a respirator has been removed from its foil bag to support a contingency readiness posture, it should be resealed in the foil bag as soon as the readiness posture is no longer required. After the respirator has been resealed

in the foil bag, all inspection requirements are waived until it is opened again. The original foil bags are long enough to be opened and resealed several times if care is taken when cutting the bag open along the end seal. If new foil bags are required, order MIL-B-131-H, Type 1, Class 1 with approximate dimensions of 48 x 12 x 8 inches. A small portable vacuum cleaner can be used to create a partial vacuum prior to sealing the foil bag. Partial vacuum means that the transit case maintains its original shape and does not collapse onto the mask. The transit case with the respirator inside must be stored horizontally so the mask lays flat on the bottom of the case. The cases should not be stacked more than six high to preclude crushing the transit case onto the masks. Recommended storage temperature range is +37° to +72° F with not more than 50 to 65% humidity. Respirators and respirators inside the transit case should at all times be kept out of continuous direct sunlight, ultra violet light, and rapid variations in temperature, i.e.; not placed alongside radiators or windows to preclude rapid changes of temperature. It is imperative to store the respirators as defined above to ensure the maximum shelf life is achieved, which is estimated at 8 to 10 years. Foil bags and heat sealer, HZ, 40 cm (15.74 inches), 110 V, are available from:

Joynt Packaging International, Inc.
ATTN: Tom Joynt
3870 Rush Mendon Rd.
Mendon, NY 14506
Phone: 585-624-2040
Fax: 585-624-2049

2-5A. Long Term Storage of the CRU-103 Regulator for C-20/C-40 Aircrew. Place caps and plugs on the regulator and put regulator and history card in a hermetically seal bag. Place inside transit case with mask. The regulator shall not be used at any time until it has been inspected in accordance with NAVAIR 13-1-6.4-2 Place-In-Service Inspection.

Section 2-2. Maintenance Scheduling

2-6. GENERAL.

NOTE

2-7. INSPECTION CYCLES. Scheduled maintenance requirements for aircraft and man-mounted equipment are published in the applicable aircraft maintenance requirement cards and this manual.

To meet unusual situations and facilitate workload scheduling, refer to OPNAVINST 4790.2 Series for authorized deviations to scheduled phase inspection intervals.

Section 2-2A. Accident Evaluation

2-7A. AIRCRAFT ACCIDENT REPORT INSPECTION.

NOTE

2-7B. Any Aviation Life Support System Equipment along with related subassemblies or equipment which have been recovered following use in an emergency ditching/bailout or ejection (refer to NAVAIR 13-1-6.2 for personnel and drogue parachutes) will be returned to the nearest Naval Supply Activity for shipment via traceable means to: Code 4.6.3.3, Naval Air Warfare Center Aircraft Division, Bldg 2187, 48110 Shaw Rd., Unit 5, Patuxent River, MD 20670-1906.

Under no circumstances will any piece of Aviation Life Support System equipment which has been subjected to ditching/bailout or ejection be returned to service.

2-7C. Stencil outside of container in 1-inch letters as follows: THIS EQUIPMENT HAS BEEN USED IN AN EMERGENCY. These items of equipment are required for evaluation and determination of design deficiency and to establish requirements for product improvement.

Section 2-3. Maintenance Documentation

2-8. GENERAL.

2-9. DOCUMENTING MAINTENANCE ACTIONS. Upon completion of any maintenance action (e.g., inspections, repairs, modifications), appropriate entries shall be made on applicable maintenance records, in accordance with OPNAVINST 4790.2 Series. The entries by the Aircrew Survival Equipmentman shall provide a systematic record of equipment history and the documentation of all maintenance actions performed on the equipment.

2-10. MAINTENANCE DOCUMENTS. Refer to OPNAVINST 4790.2 Series for documents used to record history or to document maintenance actions or for additional information for completion of maintenance records. These records are designed to provide continuous configuration and inspection records throughout the service life of ALSS assemblies and their components.

Section 2-4. Illustrated Parts Breakdown Information

2-11. GENERAL.

2-12. This section explains the Illustrated Parts Breakdown (IPB) for ALSS equipment. The IPB can be found at the end of each chapter where applicable. The IPB should be used during maintenance when requisitioning and identifying parts.

2-13. SYMBOLS AND ABBREVIATIONS. Symbols and abbreviations used in the Illustrated Parts Breakdown are as follows:

Symbol	Definition
---*---	Closure (end) of attaching parts
#	Selected part, only one used
X	By (used in dimensions 12 in. x 6 in.)
&	And

Abbreviation	Definition
AR or A/R	As Required
CAGE	Commercial and Government Entity
COML	Commercially available
FIG, Fig	Figure
GAPL	Group Assembly Parts List
GFE	Government Furnished Equipment
IPB	Illustrated Parts Breakdown
L.H.	Left Hand
MAINT	Maintenance
NHA	Next Higher Assembly
No.	Number
RECOVER, RECY	Recoverability
REF	Reference
R.H.	Right Hand
SM&R	Source, Maintenance and Recoverability
Spec. Cont.	Specification Control
Dwg. or SCD	Drawing

2-14. GROUP ASSEMBLY PARTS LIST.

2-15. The Group Assembly Parts List (GAPL) contains illustrations and parts lists for each major assembly. These illustrations and accompanying lists show how the major assemblies are disassembled into subassemblies and detail parts. Each item illustrated is indexed for identification purposes. Each illustration is accompanied by a parts list providing a part number, description, and quantity for each item. The list is arranged in disassembly order. Through the use of a system of indentation, the relationship of the detail parts to the subassemblies and the relationship of the subassemblies to the main assembly, is shown.

2-16. FIGURE AND INDEX NUMBER COLUMN.

The figure and index number of each item shown on the corresponding illustration appears in the Figure and Index Number Column, with the exception of assemblies and subassemblies which are not illustrated in assembled form. In these cases, the assemblies or subassemblies are listed but not indexed. The component parts thereof are both listed and indexed.

2-17. PART NUMBER COLUMN. This column contains the contractor's drawing number, government standard number, vendor drawing number or identifies the part as being commercial hardware (COML). Government standard parts are listed using the applicable MS, AN, AF, NAF, MIL, NIIN, or JAN part number. Where the part number is controlled by a military specification, this specification number is listed in the Description Column.

2-18. DESCRIPTION COLUMN. This column lists the item name plus those modifiers necessary to identify the item. The description of a vendor-supplied item includes a five-digit number which identifies the manufacturer. This is the Commercial and Government Entity (CAGE) code. To correlate this CAGE code to the manufacturer's name, refer to the cataloging handbook H4/H8. CAGE codes may be omitted for prime manufacturer's parts and for government standard parts. When applicable, contractor's control drawing numbers and reference designations of electronic parts are also listed for general reference. When a separate exploded view is used to show the detail parts of an assembly or subassembly the Description Column contains an appropriate figure cross-reference in parenthesis following the description. This cross-reference appears both in the listing where the assembly is first described, and in the listing which the assembly is broken down. In the latter case, the abbreviation REF will appear in the Units Per Assembly column. Commercial hardware items

(COML) are fully described so that they may be procured from normal commercial sources. Parts stocked in kits are identified with kit component code in this column, i.e., KD.

2-19. Indentation. The indentations headed 1 through 7 in the Description Column are provided to show the relationship of assemblies and their detail parts. The detail parts are indented one space to the right and listed below the assembly to which they belong. Determine the next higher assembly (NHA) of any detail part by locating, in the next space to the left (excluding attaching parts) the first item above the detailed part.

1 2 3 4 5 6 7

ARTICLE (or MAIN ASSEMBLY)

. Detailed parts for ARTICLE (or MAIN ASSEMBLY)

. ASSEMBLY

(ATTACHING PARTS)

. ATTACHING PARTS FOR ASSEMBLY

---*---

. . Detailed parts for ASSEMBLY

. . SUBASSEMBLY

(ATTACHING PARTS)

. . ATTACHING PARTS FOR SUBASSEMBLY

---*---

. . . Detailed parts for SUBASSEMBLY

. . . SUB-SUBASSEMBLY

(ATTACHING PARTS)

. . . ATTACHING PARTS FOR
SUB-SUBASSEMBLY

---*---

. . . Detailed parts for SUB-SUBASSEMBLY

2-20. Attaching Parts. Attaching parts are items used to attach parts or assemblies to each other and follow immediately after the part to be attached. The attaching parts have the same indentation as the part attached. The caption (ATTACHING PARTS) is placed on the line immediately above the listing of attaching parts. The separation symbol ---*--- appears on the line immediately under the last attaching part. Quantities of attaching parts are listed per unit. For example, if two fittings are required for each assembly and one bolt is required to attach each fitting, the correct listing would be:

. FITTING ASSEMBLY, Hinge 2
(ATTACHING PARTS)

. BOLT 1
---*---

2-21. UNITS PER ASSEMBLY COLUMN. This column shows the quantity of an item required in the next higher assembly. The abbreviation AR indicates when the quantity is As Required.

2-22. USABLE ON CODE COLUMN. Usable on codes are used to indicate part usage where various models and serial numbers of the equipment or similar parts within the equipment use different parts. A code is assigned to each variation of the equipment and entered into the GAPL when a part is used only in a specified variation. Where no code is entered, the part is used on all units covered by the GAPL or when no variations from the original equipment exist.

2-23. NUMERICAL INDEX.

2-24. The numerical index which follows each GAPL contains all the part numbers listed in that GAPL, arranged in alphabetical-numerical sequence.

2-25. PART NUMBER COLUMN. This column contains the part numbers of the parts and assemblies. Part number arrangement starts at the extreme left-hand position and continues left to right, one position at a time, according to the following order or precedence:

Space	(blank column)
Diagonal	(Slant)
Point	(period)
Dash	(hyphen)
Letters	A through Z
Numerals	0 through 9

NOTE

Spaces, diagonals, points, and dashes do not appear in the extreme left-hand position of the part numbers. However, they may be used in the second and succeeding positions and take precedence over letters and numbers as indicated above.

2-26. FIGURE AND INDEX NUMBER COLUMN. In this column, the digits preceding the dash refer to the figure in which the parts are illustrated. The digits following the dash are the index numbers.

2-27. SOURCE, MAINTENANCE AND RECOVERABILITY (SM&R) CODE COLUMN. The five digit SM&R codes, assigned by Naval Air Systems Command Representatives are reflected in the SM&R code column. The code format is composed of three parts consisting of a two-position Source Code, a two-position Maintenance Code and a one-position Recoverability Code. See [table 2-1](#) for basic information.

NOTE

For more complete information on Uniform SM&R Codes, refer to NAVSUPINST 4423.29, OPNAVINST 4410.2A, and NAVSUP P-719.

Table 2-1. Source, Maintenance, and Recoverability (SM&R) Code Definitions

SOURCE			MAINTENANCE			
1st POS	2nd POSITION		3rd POSITION		4th POSITION	
MEANS OF ACQUIRING SUPPORT			USE: LOWEST LEVEL AUTHORIZED TO REMOVE/ REPLACE THE ITEM.		REPAIR: LOWEST LEVEL WITH CAPABILITY AND RESOURCES TO PERFORM COMPLETE REPAIR ACTION.	
P	A	ITEM: STOCKED	O	ORG/UNIT	O	ORG/UNIT
	B	ITEM: STOCKED, INSURANCE				
	C	ITEM: STOCKED, DETERIORATIVE				
	D	ITEM: SUPPORT, INITIAL ISSUE OF OUTFITTING & STOCK ONLY FOR ADDITIONAL INITIAL ISSUE	2 3 4 5 6	MINESWEEPER SUBMARINES AUX/AMPHIB DESTROYER, FFG CRUISER/CARRIER	2 3 4 5 6	MINESWEEPER SUBMARINES AUX/AMPHIB DESTROYER, FFG CRUISER/CARRIER
	E	EQUIPMENT: SUPPORT, STOCKED FOR INITIAL ISSUE OR OUTFITTING OF SPECIFIED MAINTENANCE ACTIVITIES	F	I/AFLOAT	F	I/AFLOAT
	F	EQUIPMENT: SUPPORT, NONSTOCKED, CENTRALLY PROCURED ON DEMAND				
	G	ITEM: STOCKED FOR SUSTAINED SUPPORT. UNECONOMICAL TO PRODUCE AT A LATER TIME				
	H	ITEM: STOCKED, CONTAINS HAZMAT. HMIS/MSDS REPORTING REQUIRED	G	ASHORE AND AFLOAT	G	ASHORE AND AFLOAT
	R	TERMINAL OR OBSOLETE, REPLACED				
	Z	TERMINAL OR OBSOLETE, NOT REPLACED				
K	D	ITEM: DEPOT O/H & MAINTENANCE KITS	H	I/ASHORE	H	I/ASHORE
	F	ITEM: MAINTENANCE KIT, PLACE AT O, F, H, L				
	B	ITEM: IN BOTH DEPOT REPAIR AND MAINT. KITS				
M	O	MFR OR FAB AT UNIT LEVEL	K	CONTRACTOR FACILITY	K	CONTRACTOR FACILITY
	F	MFR OR FAB AT INTERMEDIATE/DS LEVEL				
	H	MFR OR FAB AT INTERMEDIATE/GS LEVEL				
	L	MFR OR FAB AT SPECIALIZED REPAIR ACTIVITY (SRA)				
	G	MFR OR FAB AT ASSEMBLED AFLOAT OR ASHORE				
	D	MFR OR FAB AT DEPOT MAINTENANCE LEVEL				
A	O	ITEM: ASSEMBLED AT ORG/UNIT	L	INTERMEDIATE SRA	L	INTERMEDIATE SRA
	F	ITEM: ASSEMBLED AT INTERMEDIATE LEVEL - AFLOAT				
	H	ITEM: ASSEMBLED AT INTERMEDIATE LEVEL - ASHORE	D	DEPOT	D	DEPOT
	L	ITEM: ASSEMBLED AT SRA				
	G	ITEM: ASSEMBLED AFLOAT OR ASHORE				
	D	ITEM: ASSEMBLED AT DEPOT MAINTENANCE LEVEL				
X	A	ITEM: REQUISITION NEXT HIGHER ASSEMBLY	Z	REF ONLY	Z	NON-REPAIRABLE
	B	ITEM: NOT PROCURED OR STOCKED, AVAILABLE THRU SALVAGE, REQ. BY CAGE/PART NUMBER			B	RECONDITION
	C	INSTALLATION DRAWING, DIAGRAM, INSTRUCTION SHEET, IDENTIFY BY CAGE/PART NUMBER				
	D	NON-STOCKED, OBTAIN VIA LOCAL PURCHASE				

RECOVERABILITY		SERVICE OPTION CODE	
5th POSITION		6th POSITION	
DISPOSITION: WHEN UNSERVICEABLE OR UNECONOMICALLY REPAIRABLE, CONDEMN OR DISPOSE.		ASSIGNED TO SUPPORT ITEMS TO CONVEY SPECIFIC INFORMATION TO THE SERVICE'S LOGISTICS COMMUNITY/OPERATING FORCES.	
O	ORG/UNIT	1	I-LEVEL 1ST DEGREE
F	I/AFLOAT	2	I-LEVEL 2ND DEGREE
G	ASHORE AND AFLOAT	3	I-LEVEL 3RD DEGREE
H	I/ASHORE	6	COMMERCIAL ITEM, ORGANICALLY MFR'D
K	DLR; CONTRACTOR FACILITY	8	NON-CONSUMABLE; 2ND DEGREE ENGINE I-LEVEL
		9	NON-CONSUMABLE; 3RD DEGREE ENGINE I-LEVEL
L	INTERMEDIATE SRA LEVEL	E	END TO END TEST
		J	INTER-SERVICE DLR REPAIRABLE BELOW D-LEVEL
D	DLR; CONDEMN OR DISPOSE AT DEPOT	P	PROGRESSIVE MAINTENANCE
Z	NON-REPAIRABLE	R	GOLD DISC REPAIR
A	NON-REPAIRABLE BUT REQUIRES SPECIAL HANDLING	T	TRAINING DEVICES

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CHAPTER 3

A/P23P-14A(V) RESPIRATOR ASSEMBLY

Section 3-1. Description

3-1. GENERAL.

3-2. The A/P23P-14A(V) Respirator Assembly is composed of the MCK-3A/P Mask with nose occluder, the Lower Assembly and the A/P37S-1 Intercom Set.

3-3. The Respirator Assembly is the above the neck portion of the chemical, biological and radiological (CBR) protective assembly. It is designed to provide aircrewmembers with the necessary head, eye, and respiratory protection to guard against the toxic and lethal effects of nuclear fallout and chemical and biological agents. During in-flight and ground operations, the respirator fits beneath standard issued helmets and protective equipment with a minimum of interference (figure 3-1).

3-4. The Pusher Fan provides the aircrewmember with a blown and filtered air supply (figure 3-1).

3-5. The A/P37S-1 Intercom Set provides the aircrewmember with direct voice communication while wearing the respirator and protective helmet (figure 3-1).

3-6. CONFIGURATION.

3-7. The A/P23P-14A(V) Respirator Assembly is shown in figure 3-1. There are no variants at this time.

3-8. COMPONENT DESCRIPTION.

3-9. MCK-3A/P MASK. The mask includes the components as described in the following paragraphs.

3-10. Hood Assembly. The hood assembly (figure 3-2), made of an impervious bromo-butyl rubber, covers the entire head and extends down past the neck area where it is bonded to the upper edge of the bellows. The lower edge of the hood is bonded to the apron. The neck seal, made of natural rubber, is bonded to the inner surface of the bellows, isolating the head and neck.

3-11. Faceplate. A molded, one-piece, polycarbonate faceplate (figure 3-3) is sealed into the front of the hood. The upper part, or optical area, is transparent. The lower part (painted black) is shaped to fit the wearer's lower face. The inner perimeter of the mask hood overlaps the faceplate and is sealed to its outer edges. A strip of rubber, secured to the inner surfaces of the hood and faceplate, seals the faceplate to the hood. A strip of foam rubber is bonded over the sealing strip for comfort when the hood is worn. Attached to or mounted on the faceplate is a nose occluder, a toggle harness, an anti-suffocation disconnect, an internal drink tube for the drink facility and a microphone assembly.

NOTE

The left or right side refers to the aircrewmember's left or right side, when wearing the MCK-3A/P Mask.

3-12. Orinasal Mask. The orinasal mask (figure 3-3), molded of soft silicone rubber, fits over the wearer's nose and mouth. The orinasal mask incorporates a turned-under edge, increasing the seal around the wearer's face. The orinasal mask is mounted within the shaped faceplate. Located on the right-side of the orinasal mask is an externally mounted deflector plate constructed of Noryl plastic. This plate deflects the blown air across the faceplate, keeping the visual area mist-free. Other features located within the orinasal mask are the inhalation duct, exhalation duct, microphone duct, and drink facility port.

3-13. Faceplate Ripaway Tab. The faceplate ripaway tab (figure 3-4) consists of a rubber coated nylon strip and attached tab bonded to the lower right portion of the faceplate. The nylon strip bonds the faceplate to the butyl cowl. Pulling the ripaway tab creates a slit between the faceplate and cowl. The faceplate can then be removed from the cowl by placing fingers into the slit and pulling the faceplate from the cowl. A red colored servicing clip is to be in position at all times the mask is not worn, particularly during handling, maintenance, and servicing operations. The servicing clip prevents inadvertent removal of the nylon strip.

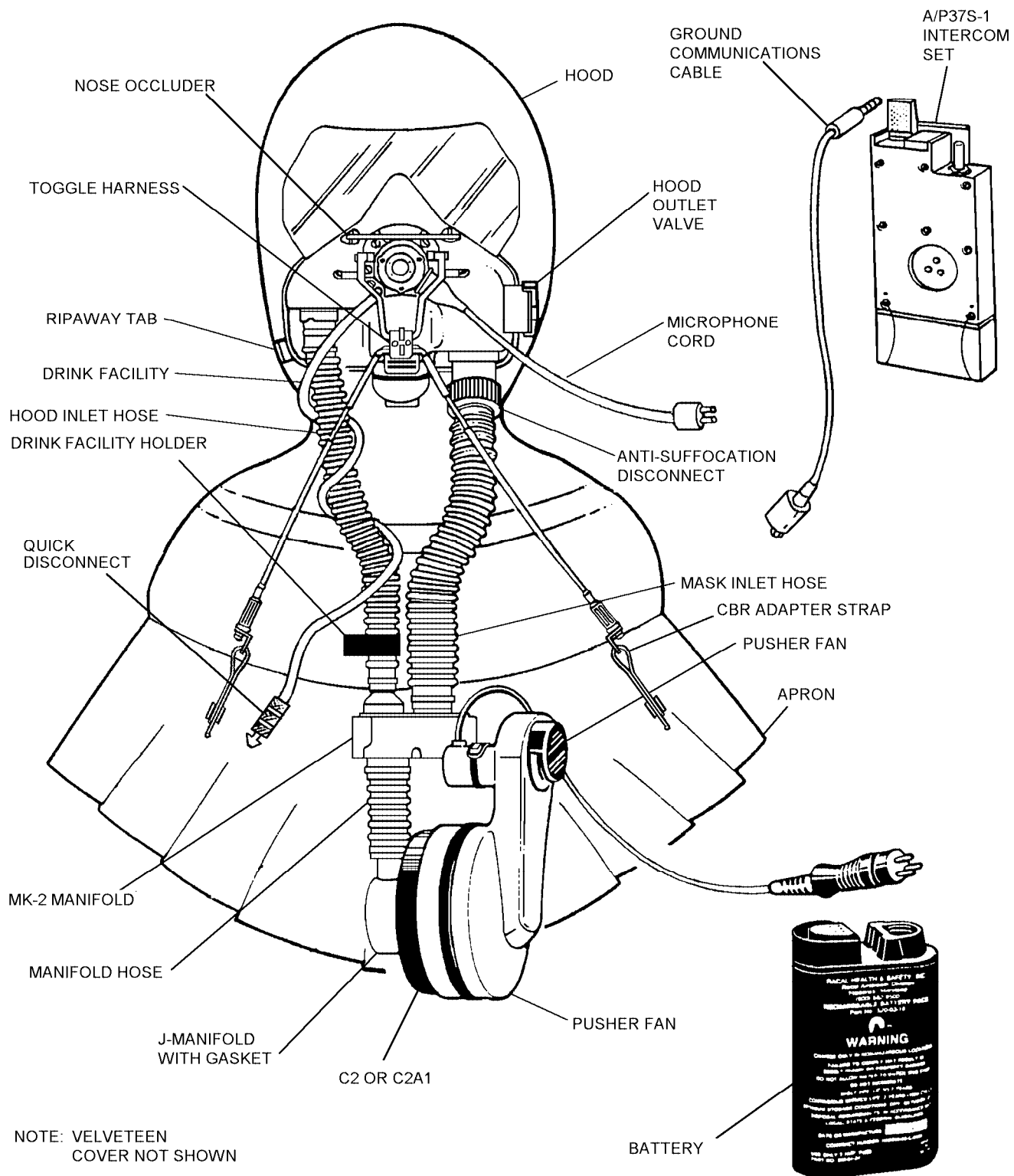


Figure 3-1. A/P23P-14A(V) Respirator Assembly (Upgrade), Non Oxygen

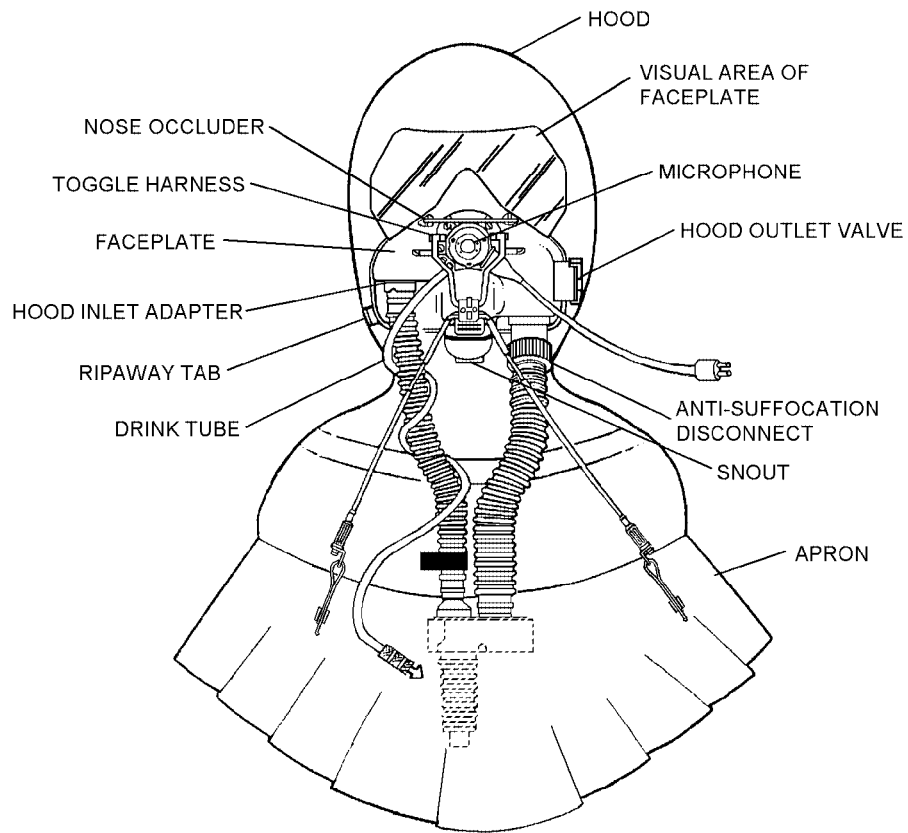


Figure 3-2. MCK-3A/P Mask Assembly

3-2

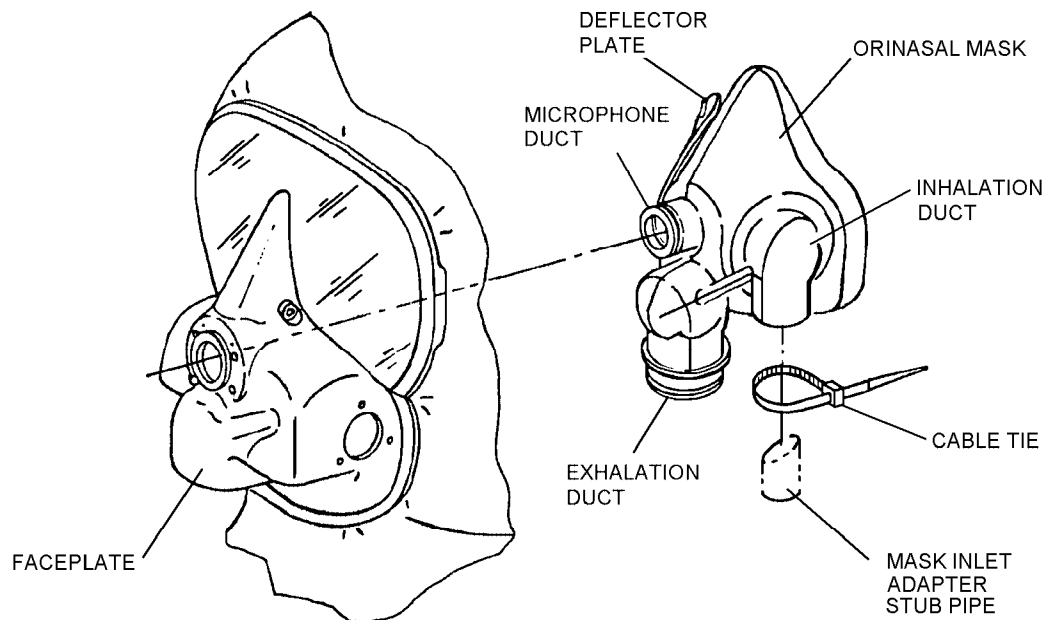


Figure 3-3. Faceplate/Orinasal Mask

3-3

3-14. Hood Inlet Adapter. The hood inlet adapter (figure 3-5) is positioned within a port to the right side of the faceplate and connects the hood inlet hose from the MK-2 manifold assembly to the hood compartment of the mask.

3-15. Hood Outlet Valve. The hood outlet valve (figure 3-6) is mounted on the left side of the faceplate, below the visual area and above the oxygen inlet adapter on the orinasal mask. The valve consists of a stepped rubber valve, valve seat, an external slotted cover, and a manually operated shut-off lever. The purpose of the hood outlet valve is to permit the hood demisting air to exit the hood. The valve can be closed in the event the pusher fan fails to provide a supply of blown air.

3-16. Hood Inlet Valve. The hood inlet valve (figure 3-7) is located within the MK-2 manifold. The valve consists of a stepped rubber valve and valve seat. The purpose of this valve is to prevent air from being drawn from the hood compartment into the orinasal mask via the MK-2 manifold in the event of high volume breathing demand or pusher fan failure.

3-17. Inhalation Valve and Iceguard. The inhalation valve (figure 3-8), mounted in the left side of the orinasal mask, consists of a molded plastic valve seat, with a stepped rubber valve inserted into the molding

by its shaft. An iceguard, in the form of a fine mesh, covers the outlet port of the valve. The iceguard is retained in position by lugs engaging slots in the valve seat. The purpose of the inhalation valve is to allow filtered blown air to enter the orinasal mask.

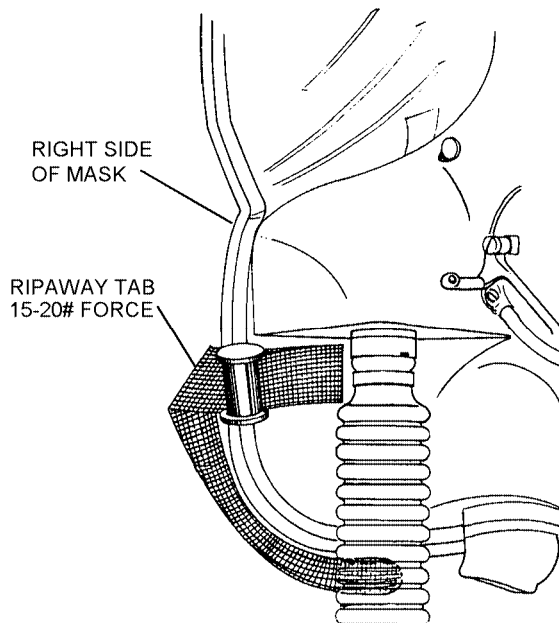


Figure 3-4. Faceplate Ripaway Tab

3-4

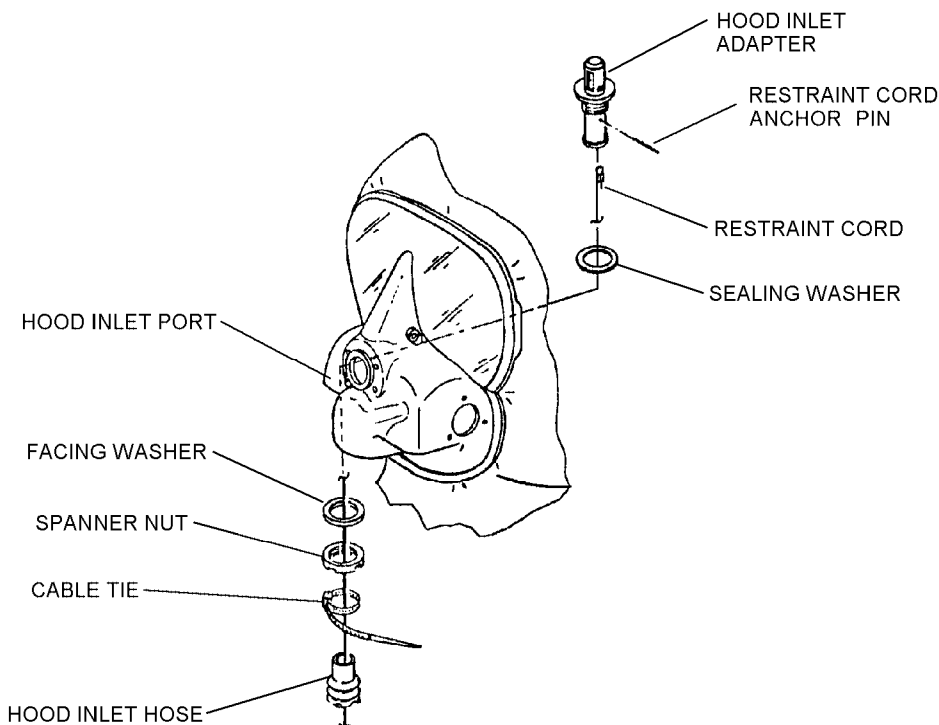


Figure 3-5. Hood Inlet Adapter

3-5

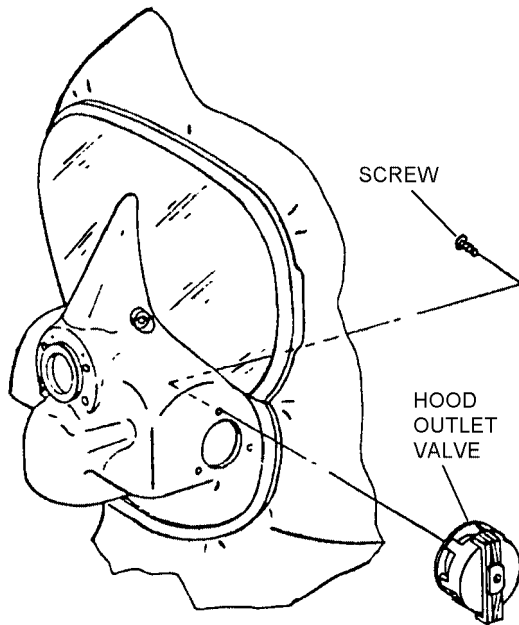


Figure 3-6. Hood Outlet Valve

3-18. Compensated Exhalation Valve. The compensated exhalation valve (figure 3-9) is a molded plastic outlet valve mounted within the exhalation duct of the orinasal mask, with its compensated chamber connected into the orinasal mask inlet. The purpose of the compensated exhalation valve is to allow exhaled gases to be expelled into the environment when the pressure inside the orinasal mask is greater than the pressure in the outlet housing chamber.

3-19. Exhalation Outlet Valve. The exhalation outlet valve (figure 3-9) is a secondary valve fitted in the exhalation duct below the compensated exhalation valve. The exhalation outlet valve consists of a stepped rubber valve positioned on a valve holder which is secured by an externally mounted spacer washer and ring nut. This secondary valve will prevent the inward leakage of contaminated air in the event of the compensated exhalation valve sticking in the open position. The small volume of air trapped between the compensated exhalation valve and the exhalation outlet valve will greatly reduce inward leakage in the event of pusher fan failure.

3-20. Snout. The snout (figure 3-9) is clamped to the ring nut securing the exhalation outlet valve to the faceplate. The snout, made from material of low thermal conductivity, acts as a chamber to trap the warm exhaled air and prevents freezing of the exhalation valves. The snout opens to the environment by a downward facing slot.

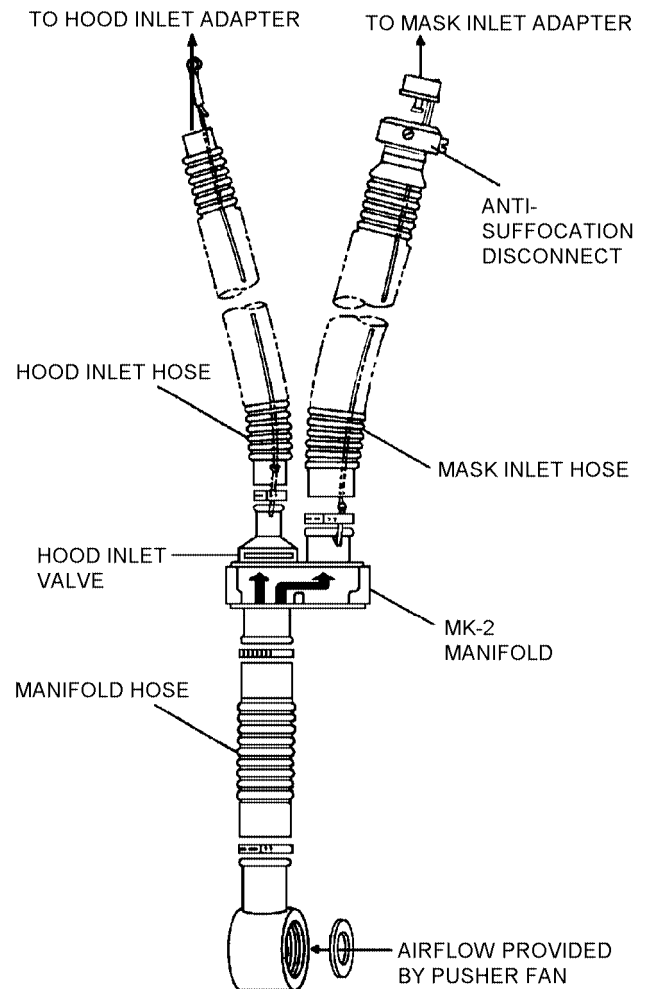


Figure 3-7. MK-2 Manifold Assembly

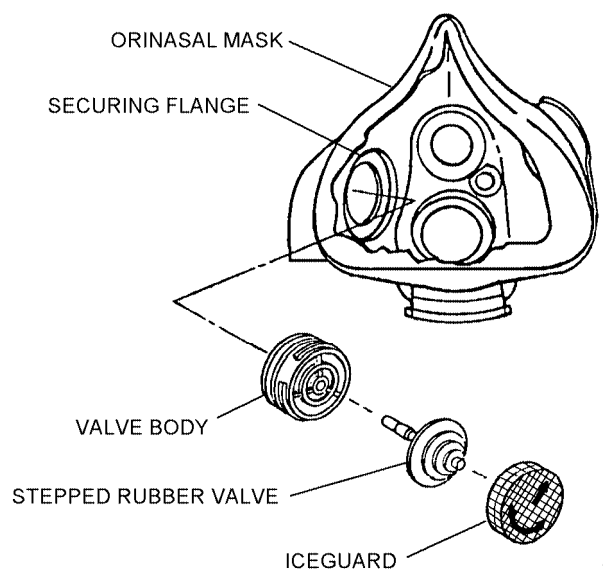


Figure 3-8. Inhalation Valve Assembly

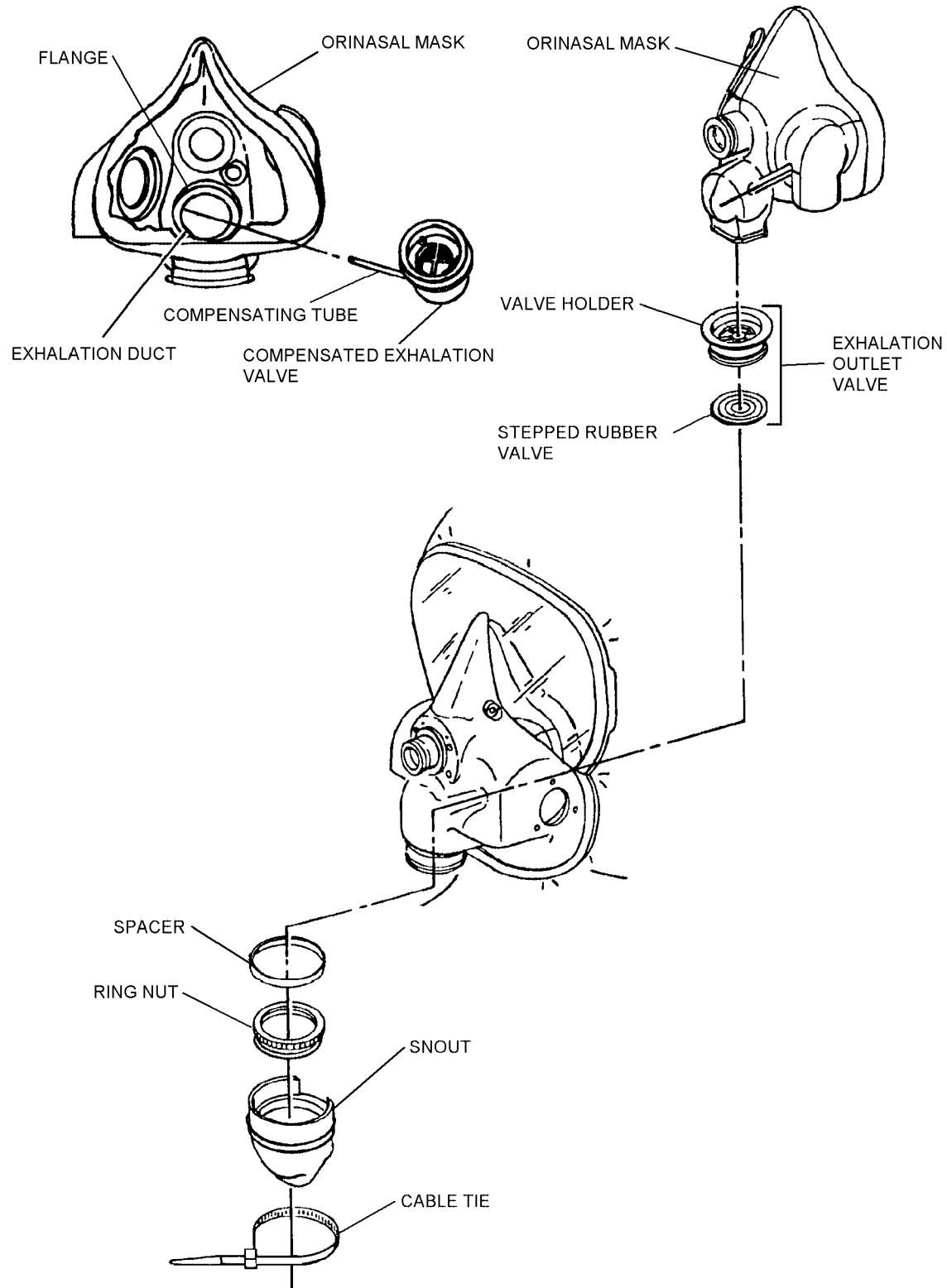


Figure 3-9. Compensated Exhalation Valve/Exhalation Outlet Valve/Snout

3-21. Anti-Suffocation Disconnect/Mask Inlet Adapter. The anti-suffocation disconnect, located at the upper end of the mask inlet hose, is manually unlocked from the mask inlet adapter on the faceplate by an inward clockwise rotation of a knurled locking ring toward the mask, which breaks a shear screw (figure 3-10). Two (2) torque buttons aid in the application of pressure to break the shear screw for quick disconnect in emergency situations. The mask inlet hose may then be separated from the mask inlet adapter by pulling firmly down on the hose.

3-22. Canteen and Drink Facility. The drink facility (figure 3-11) consists of an internal drink tube (mouthpiece) located within the orinasal mask, a butyl external drink tube that is wrapped around the hood inlet hose and a self-sealing quick disconnect at the canteen end. A two quart collapsible canteen (NIIN 01-118-8173) and cover (NIIN 01-118-8175), fitted with a shoulder strap is connected to the drink facility and provides drinking water to the aircrewmember. An M-1 canteen cap (NIIN 00-930-2077) is fitted to the canteen. The quick disconnect is stored in the rubber quick disconnect holder on the hood inlet hose when not in use, or to drink, attached to the M-1 canteen cap on the canteen. The drink facility is CBR resistant and may be used in a contaminated environment if connected to the canteen in an uncontaminated environment. For additional information, see the applicable aircraft NATOPS manual.

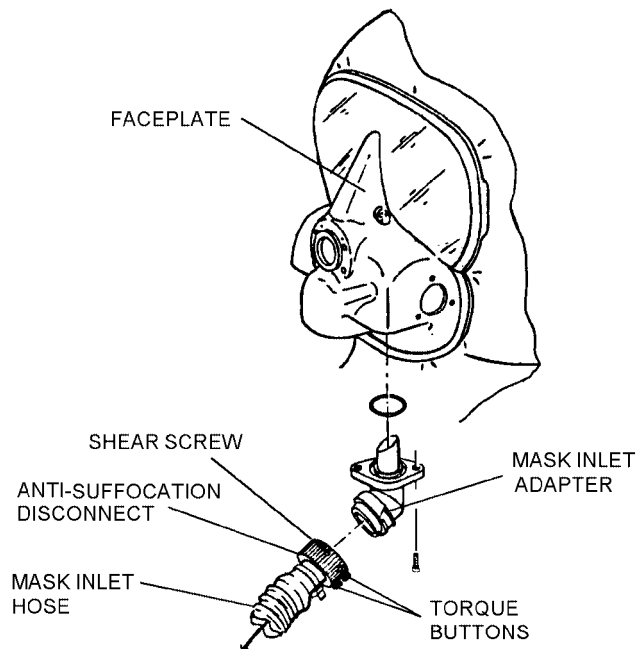


Figure 3-10. Anti-Suffocation Disconnect/Mask Inlet Adapter

3-10

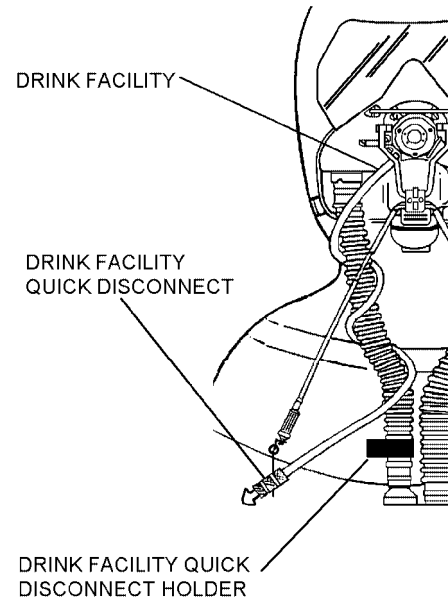


Figure 3-11. Drink Facility

3-11

WARNING

If canteen is disconnected in a CBR contaminated environment, do not reconnect until all matching connectors are free of contamination.

NOTE

The label, mounted on front of mounting bracket of toggle harness identifies manufacturer, part number, and serial number of the MCK-3A/P Mask.

3-23. Toggle Harness Assembly. The toggle harness assembly (figure 3-12) is mounted on the front of the faceplate, around the microphone. The assembly is held in place by four (4) countersunk screws which pass through the MCK-3A/P Mask harness assembly and into the faceplate. The screws are drawn tight by four self-locking nuts. A V-shaped hinged bow, which freely pivots upward or downward, is suspended from two rectangular studs protruding from the MCK-3A/P Mask harness assembly. Attached to the end of the bow is a toggle plate which pivots upward and downward and provides the tension for tightening the MCK-3A/P Mask to the aircrewmember's face. Two cable assemblies are connected to the toggle plate, and each is fitted with an adjustable swivel link which allows the cable assemblies to be adjusted approximately 1 inch in length for proper mask tension. The swivel link is attached to the CBR adapter strap which is used to couple a helmet to the MCK-3A/P Mask. The adapter strap is attached to the swivel link with C-clips. When coupling, the cable

assemblies should lie over the hooks on the V-bow before the swivel link is connected to the helmet.

3-24. Microphone Assembly. The microphone assembly (figure 3-13) consists of a microphone, communication cable, and terminal plug that can be connected to the socket of an aircrew helmet. The microphone is fitted through the central pod of the faceplate and into the rubber port of the orinasal mask, assuring a seal of the orinasal mask housing within the faceplate. The microphone is retained in place by a cable tie, cinched around the rubber portion of the orinasal mask that protrudes outward through the faceplate.

3-25. Hood Inlet Hose. The hood inlet hose connects the hood inlet adapter on the right side of the orinasal mask to the right outlet port of the MK-2 manifold.

3-26. Mask Inlet Hose. The mask inlet hose connects the oxygen inlet adapter on the left side of the orinasal mask to the left outlet port of the MK-2 manifold.

WARNING

Either a nose occluder or butyl rubber blanking plugs must be installed to ensure CBR protection.

NOTE

Most aircrewmembers may fly with just blanking plugs installed; however, it is recommended that nose occluders be fitted and installed for all aircrewmembers to facilitate the valsalva procedure.

3-27. Nose Occluder. The optional nose occluder assembly (figure 3-14) is mounted through the nose bridge of the faceplate. The assembly is available in sizes ranging from 4 mm to 7 mm in increments of 1 mm in both short and long size ranges. The occluder consists of a pair of shaft subassemblies, with nylon rollers, that can be swept down over the nose area of the orinasal mask. The shaft assemblies are operated by manually raising the stirrup that is mounted externally on the faceplate surface. Butyl rubber blanking plugs installed in the faceplate nose occluder bushings shall not be removed unless a nose occluder is being installed. Protection against chemical agents will not be degraded if the plugs are properly installed and remain fully seated.

3-28. LOWER ASSEMBLY. The lower assembly (figure 3-15) consists of the MK-2 manifold and pusher fan subassembly.

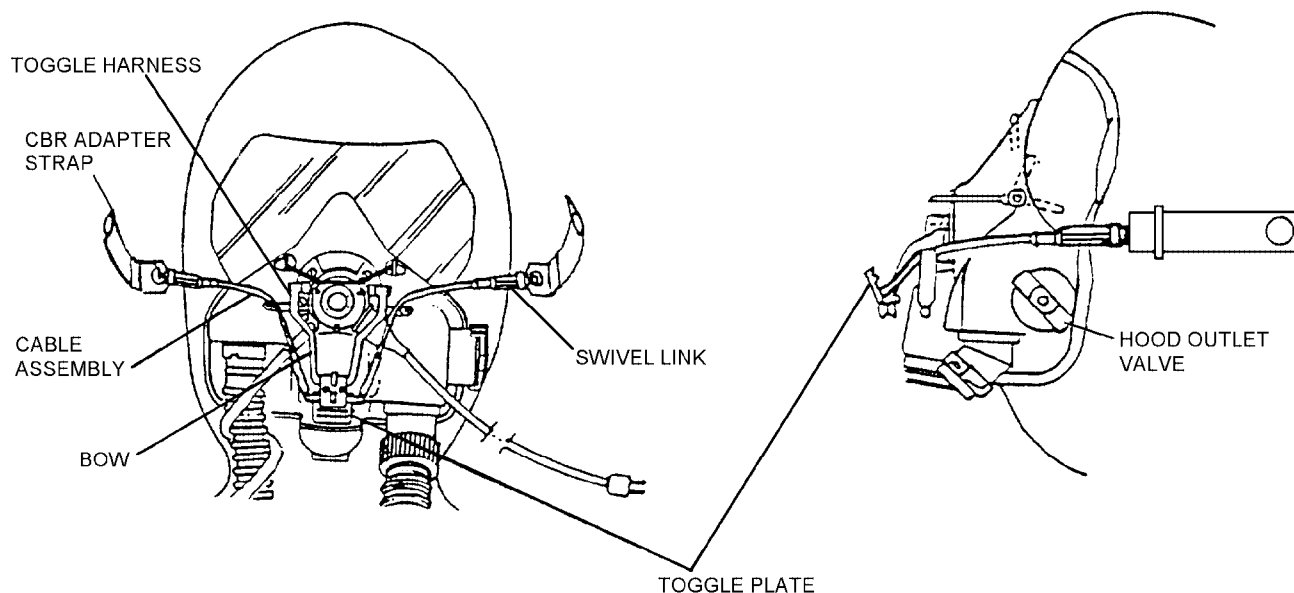


Figure 3-12. Toggle Harness Assembly

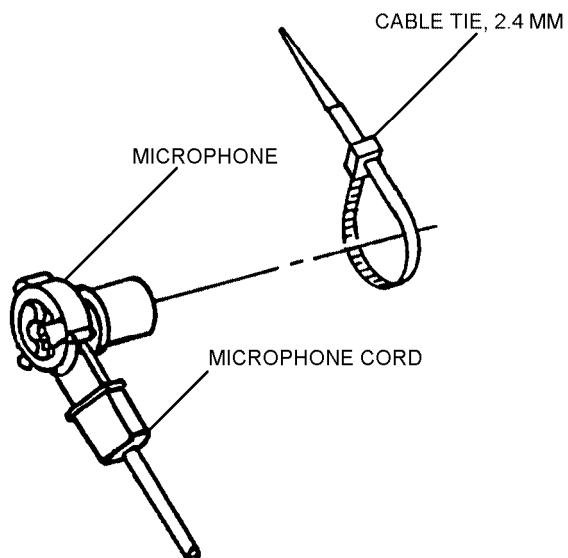


Figure 3-13. Microphone Assembly

3-13

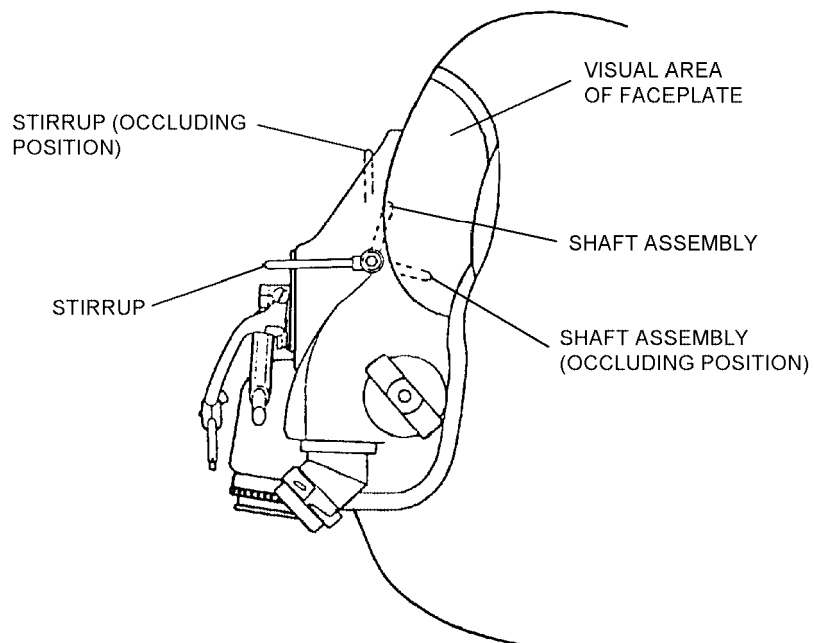


Figure 3-14. Nose Occluder

3-14

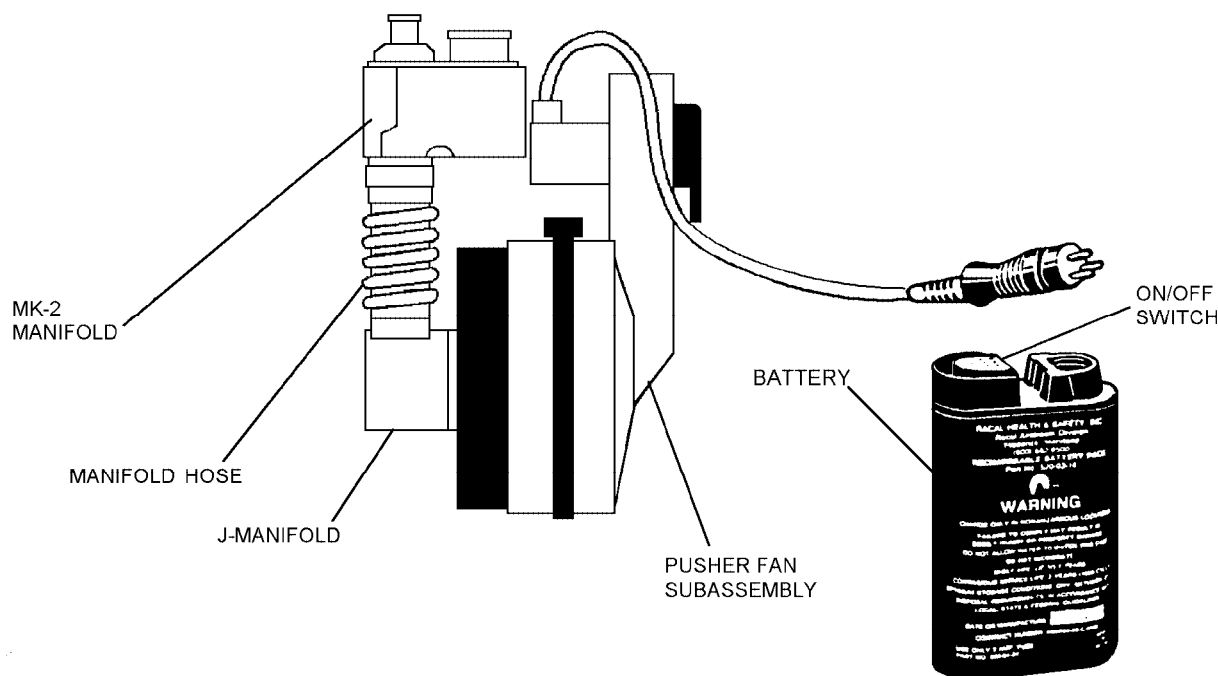


Figure 3-15. Lower Assembly

3-29. MK-2 Manifold. The MK-2 manifold is a three port crossover valve receiving connecting hoses from the MCK-3A/P Mask and a hose from the pusher fan subassembly (manifold hose).

3-30. Pusher Fan Subassembly. The Pusher Fan Subassembly consists of the following:

3-31. Manifold Hose. The Manifold hose is manufactured from ethylene propylene rubber and is corrugated for flexibility. The 3/4 inch end of the hose is secured to the MK-2 manifold inlet and the 7/8 inch end is secured to the J-manifold, using stepless low profile clamps.

3-32. J-Manifold. The J-manifold is manufactured from aluminum stock. The large circular end of the manifold is threaded to accept a C2 or C2A1 canister and contains a rubber gasket that provides the canister with an airtight seal. The other end is connected to the manifold hose.

3-33. Canister. The C2 canister is a standard, NATO approved, charcoal filter canister. It is currently being replaced by the C2A1 canister. Either the C2 or C2A1 canister may be used with the A/P23-14A(V) Respirator Assembly.

3-34. Pusher Fan with Battery. The pusher fan consists of a molded rubber boot, housing, and an internal centrifugal fan. The large, open end of the rubber boot fits over the C2 or C2A1 canister and is secured with a cable tie. An electrical cord connects the fan to a rechargeable NiCad battery or non-rechargeable Lithium Battery. The battery is a self-contained unit capable of providing four hours of continuous power. An on/off push switch is located on top of the battery.

3-35. ADDITIONAL EQUIPMENT.

3-36. A/P37S-1 Intercom Set. The A/P37S-1 Intercom Set consists of a slim-line rectangular case convenient for storage in a pocket (figure 3-16). The intercom unit contains a battery-powered audio frequency amplifier, a single three-position toggle switch, and two jack sockets protected by hinged cover flaps. Sidetone is automatically provided at both headsets. The intercom set is turned on by plugging the communications cord into either of the two jack sockets. Communication is established via a transducer mounted within the

intercom unit. When the toggle switch is set to the off position (furthest away from the jack sockets) the transducer remains switched out of circuit. Moving the toggle switch into its central position connects the transducer into its microphone (MIC) mode. Communication between two headsets then remains available, but speech signals from any source received at the transducer are also transmitted to both headsets. Moving (and holding) the toggle switch towards the jack sockets switches the speech signals from both headset positions. When released, the toggle switch returns to the central (MIC) position.

3-37. ARS Fitting Frames. The Aircrew Respirator Spectacle fitting frames provide a means for fitting aircrew personnel with corrective lenses, and are compatible with the MCK-3A/P Mask. The ARS fitting frames are supplied in five sizes (figure 3-17). Fitting frames with prescription lenses shall be ordered through the Naval Ophthalmic Support and Training Activity (NOSTRA), Yorktown, Virginia. Prescriptions shall be mailed or faxed, utilizing Form DD771 (figure 3-19), to NOSTRA requesting ARS fitting frames. An alternate method of ordering frames and lenses may be found on website at www.srts.amedd.army.mil. Specify the temple length. Contact:

NOSTRA, MATERIAL MANAGER
160 Main Rd., Suite 350
Yorktown, VA 23691
Fax DSN: 953-4511
COM: 757-887-4511
Phone DSN: 953-4261
COM: 757-887-4261

3-38. Transit Case. The transit case is provided as a means of protection for the MCK-3A/P mask, intercommunication unit, fitting frames, intercom cord, drink facility, optional skull cap, sweatband, and talc powder during transit or storage (figure 3-18).

3-39. CMU-23A/P Survival Vest - MK-2 Manifold Assembly and Pusher Fan Retention Pocket. ACC 616 provided instructions for the fabrication of a retention pocket and for mounting the pocket on either the SV-2 survival vest or the CMU-23/P survival vest (figure 3-20). Once these vests are modified, they are redesignated the CMU-23A/P survival vest. Refer to NAVAIR 13-1-6.7-2, Aircrew Personal Protective Equipment (Clothing) for inspection and maintenance of the CMU-23A/P vest.

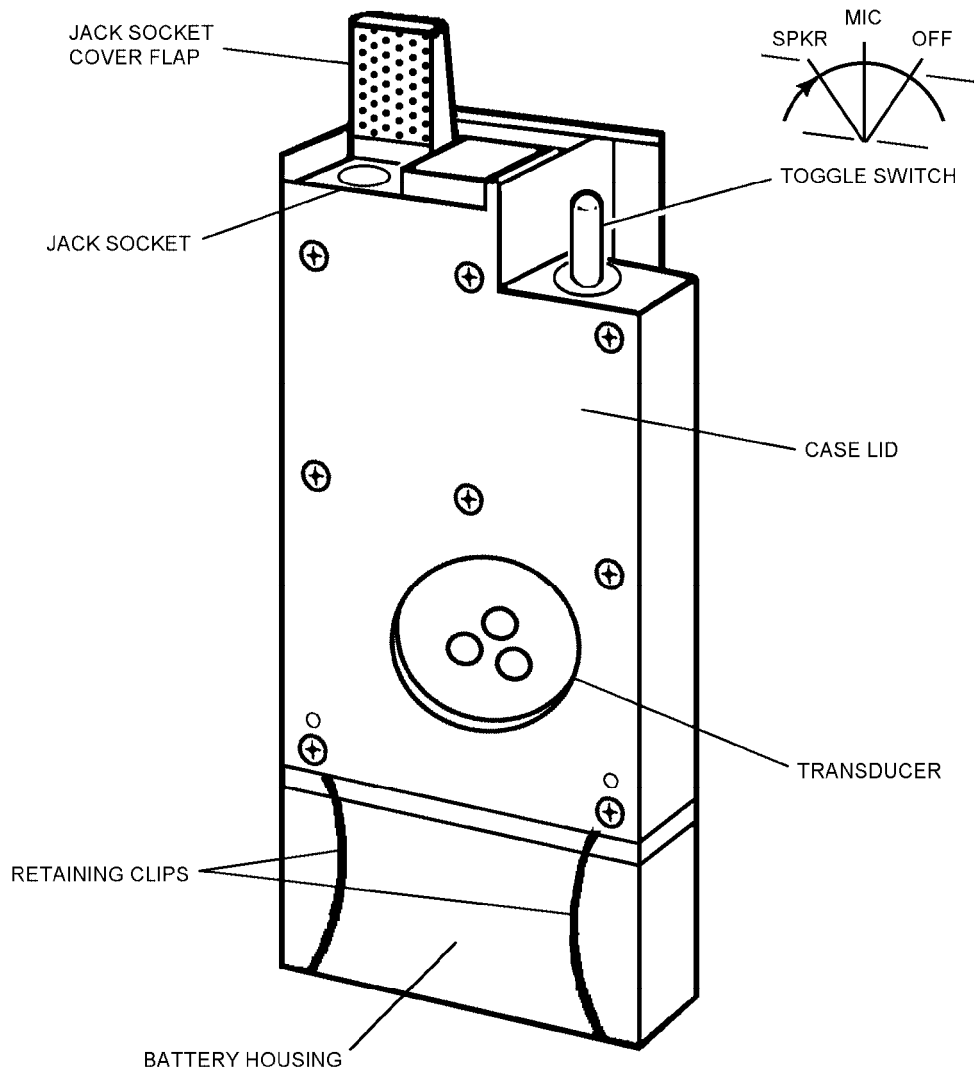


Figure 3-16. A/P37S-1 Intercom Set

3-16

3-40. HGU-67/P Helmet and HGU-84/P Series Helmet. The HGU-67/P helmet and HGU-84/P series helmets are used with the A/P23P-14A(V) respirator assembly. These helmets are form-fitted and configured as necessary to meet application requirements. Refer to NAVAIR 13-1-6.7-3 for inspection and maintenance procedures.

3-41. APPLICATION.

3-42. The Respirator Assembly is intended for use by helicopter aircrew personnel for both ground and in-

flight operations. Helmets will be worn over the MCK-3A/P Mask to provide head protection for in-flight operations. Refer to NAVAIR 13-1-6.7-3 for applicable helmets.

3-43. FUNCTION AND OPERATION.

3-44. NORMAL OPERATION.

3-45. MCK-3A/P Mask. The inside of the mask is divided into two compartments (figure 3-23), the orinal area and the hood compartment. This configuration

provides for a separate breathing and ventilation facility. Filtered air is supplied via the lower assembly.

3-46. Orinasal Mask. The mask inlet hose permits passage of air into the orinasal mask. As the user inhales, air passes through the inhalation valve to the user. Air will also enter the compensating tube extending into the inhalation duct from the compensated exhalation valve, exerting pressure on the backside of the valve which prevents the escape of air and the entry of agents through the exhalation outlet. Exhalation re-seats the stepped rubber inhalation valve so that exhaled air exits the assembly through the exhalation outlet valve (figure 3-23).

3-47. Nose Occluder. The nose occluder, incorporated into the faceplate, permits the aircrewmember to equalize pressure during flight. When properly fitted, raising the occluder stirrup on the outside of the faceplate should pinch the nose closed, facilitating the valsalva maneuver enabling the aircrewmember to clear his ears.

3-48. Toggle Harness Assembly. The toggle harness assembly provides the proper retention necessary for securing the MCK-3A/P Mask to a protective helmet.

3-49. Hood Compartment. The hood inlet hose supplies air to the assembly for hood pressurization and lens defogging. Pressurization of the hood ensures no harmful agents can enter and helps cool the user's head. Lens defogging is accomplished by directing the

incoming air across the lens by means of a deflector plate attached to the orinasal mask. Air exits the hood compartment through the hood outlet valve. The hood outlet valve can be closed in the event the pusher fan fails (figure 3-21). This feature prevents any toxic agent or contaminant from entering the hood compartment of the respirator. When closed, the hood outlet valve prevents water from entering the hood compartment, while the aircrewmember is seated in the upright position, on emergency immersion into water.

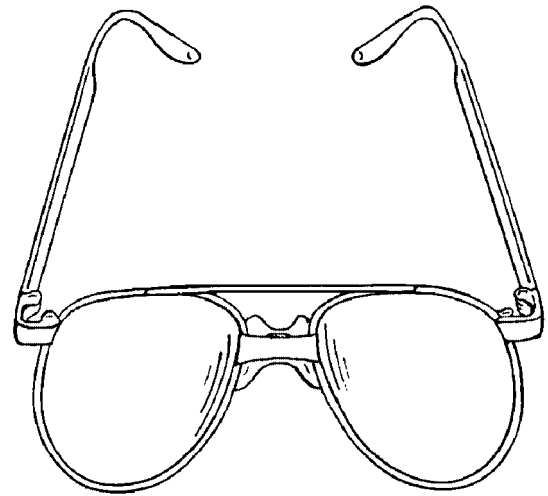


Figure 3-17. ARS Fitting Frames

3-17

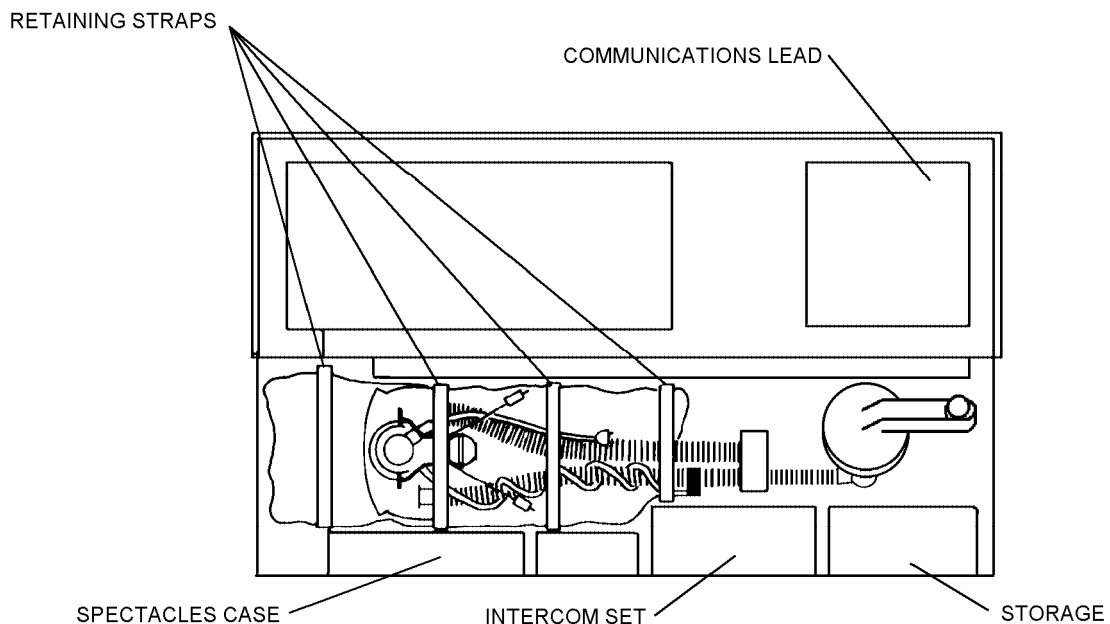


Figure 3-18. Transit Case

3-18

EYEWEAR PRESCRIPTION				DATE		ORDER NUMBER	
TO: (Optical Laboratory, including ZIP Code) NOSTRA PO BOX 350 YORKTOWN, VA 23691-0350				FROM: (Station & Location, including ZIP Code)			
NAME (Last, first, middle initial) GRADE AND SERVICE NUMBER/SOCIAL SECURITY ACCOUNT NO						AGE	
UNIT AND ADDRESS							
<input type="checkbox"/> ACTIVE DUTY <input type="checkbox"/> RETIRED <input type="checkbox"/> OTHER (Specify)		<input type="checkbox"/> USA <input type="checkbox"/> USN <input type="checkbox"/> USAF <input type="checkbox"/> USPHS <input type="checkbox"/> USCG <input type="checkbox"/> OTHER (Specify)					
PRESCRIPTION							
SPECTACLES: <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE		AVIATION SPECTACLES <input type="checkbox"/> N-15 <input type="checkbox"/> COATED <input type="checkbox"/> CLEAR					
OTHER: <input type="checkbox"/> REPAIR <input type="checkbox"/> PROTECTIVE MASK INSERT (Specify type and position)							
INTERPUPILLARY DIS DISTANCE	NEAR	EYE SIZE	BRIDGE SIZE	TEMPLE LENGTH AND STYLE		NUMBER PAIR(S)	CASE
SINGLE VISION							
	SPHERE	CYLINDER	AXIS	DECEN- TRATION IN OUT	PRISM	BASE	FOR LABORATORY USE ONLY
R							<input type="checkbox"/> STANDARD
L							<input type="checkbox"/> NONSTANDARD
							<input type="checkbox"/> FINISHED STOCK
							<input type="checkbox"/> CYLINDER SURFACE
							<input type="checkbox"/> SPHERE SURFACE
MULTIVISION							<input type="checkbox"/> SINGLE VISION
	ADD FOR NEAR	MULTIFOCAL INSTRUCTIONS		TOTAL DECENTRATION			<input type="checkbox"/> BIFOCAL
		SEGMENT HT	DECENTRATION NEAR				<input type="checkbox"/> TRIFOCAL % INT
R							<input type="checkbox"/> TINT
L							<input type="checkbox"/> OTHER
SPECIAL LENSES OR FRAME (Details and/or circumstances necessitating prior approval under current instructions and/or regulations. Only identical duplicate prescriptions and components should be ordered on the same DD Form 771.)							
TYPED OR PRINTED NAME, GRADE, TITLE AND SIGNATURE OF APPROVING AUTHORITY							
TYPED OR PRINTED NAME, GRADE, TITLE AND SIGNATURE OF PRESCRIBING OFFICER							
DISTRIBUTION OF COPIES		CLINIC Originating Prescription - Removes Copy 3 for insertion in patient's Health Record (DD Form 722). Sends Copies 1 and 2 to designated optical laboratory. LABORATORY - Retains Copy 1 for file. Returns Copy 2 with completed spectacles.					

DD FORM 771
1 SEP 66

EDITION OF 1 DEC 66. MAY BE USED.

S/N0102-LF-007-6202

1

Figure 3-19. ARS Fitting Frames Ordering Form

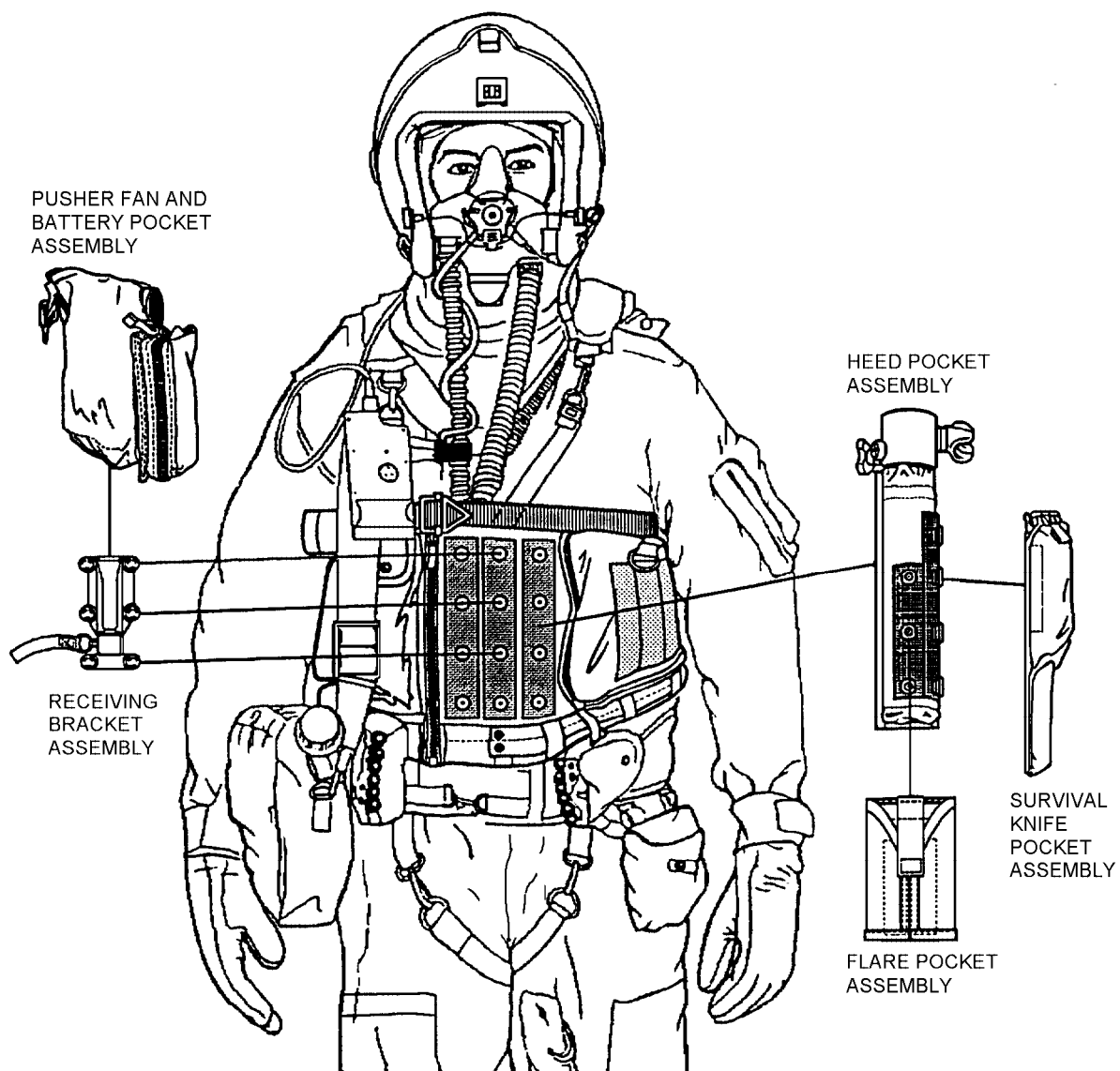
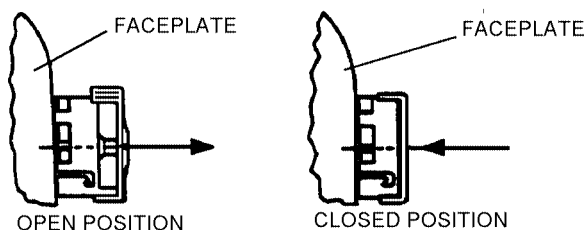


Figure 3-20. CMU-23A/P Survival Vest



3-21

Figure 3-21. Hood Outlet Valve Operation

3-50. Drink Facility. When wearing the A/P23P-14A(V) and the associated below-the-neck (BTN) garments, the thermal burden placed on the user increases dramatically. This, in turn, significantly increases the risk of dehydration. To prevent, or minimize, the physiological effects of dehydration, a drink facility has been incorporated into the design of the respirator. It is mandatory that the lower end of the drink tube be connected to the canteen cap prior to exposure to a potentially CB contaminated environment. Connecting or disconnecting the drink tube at any other time risks compromising the protection afforded by the respirator assembly. The aircrewmember drinks by maneuvering the upper end of the tube, located inside the orinatal mask, into the mouth. The aircrewmember then gently squeezes the canteen to force the liquid up the tube and into the mouth. It is recommended that the aircrewmember drink small amounts of fluid at regular intervals rather than wait for the body to signal its need for fluid replacement. Operation of the drink facility is as follows:

1. Connection and use of the drink facility (figure 3-22).

a. In a CB contaminant free ready room remove drink facility quick disconnect from drink facility holder.

b. Open canteen cap.

c. Connect drink facility quick disconnect to canteen cap.

d. To drink, squeeze canteen hard with both hands, against chest or under right arm, or hold canteen upside down over head.

e. Pause and blow into canteen periodically to avoid canteen collapsing.

2. Disconnecting drink facility. It is mandatory that drink facility not be disconnected until doffing the entire ensemble in a clean or decontaminated area. However, if the drink facility needs to be removed, proceed as follows:

WARNING

If canteen is disconnected in a CB contaminated environment, do not reconnect until all matching connectors are free of CB contamination.

a. Disconnect drink facility from canteen by pulling and twisting connector valve. Close canteen cap flap.

b. Secure free end of drink facility by inserting it into drink facility holder mounted on hood inlet hose.

c. Unhook canteen from straps. Connect straps together to facilitate finding them later.

d. Properly stow canteen.

3-51. Microphone Assembly. The microphone assembly allows the aircrewmember to communicate while wearing the MCK-3A/P Mask during flight and on-ground.

3-52. Lower Assembly. The Lower Assembly provides the aircrewmember with filtered air for both the hood and orinatal mask compartments.

3-53. MK-2 Manifold. The MK-2 Manifold receives filtered air from the pusher fan subassembly and passes it on to the hood and orinatal mask compartments via the hood inlet hose and mask inlet hose.

3-54. Pusher Fan Subassembly. The battery operated pusher fan forces ambient air through a C2 or C2A1 filter canister, and into the manifold hose and on to the the MK-2 manifold where it is distributed to the hood and mask inlet hoses. This low, positive pressure air prevents the entry of CB contaminants. C2 or C2A1 canisters are standard issue NATO charcoal filters that act as a protective barrier against CB agents. The pusher fan battery is either a dc voltage NiCad rechargeable battery (which allows the pusher fan to operate for 3 1/2 to 4 hours of continuous use) or a non-rechargeable Lithium Battery (capable of providing 10 hours of continuous use). The battery power is turned ON by pressing the rubber boot covered ON/OFF switch on top of the battery opposite the pusher fan battery terminal cable.

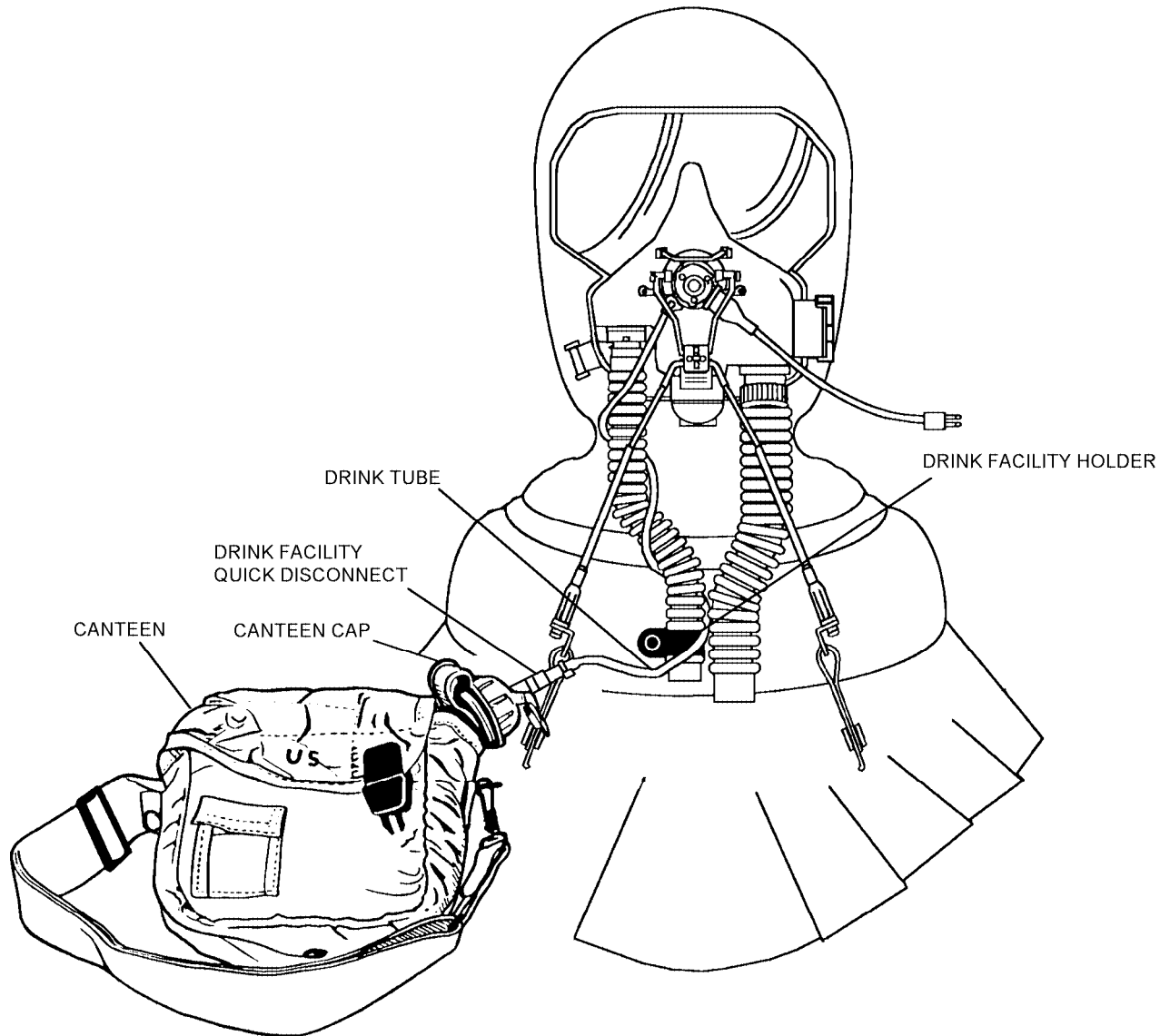
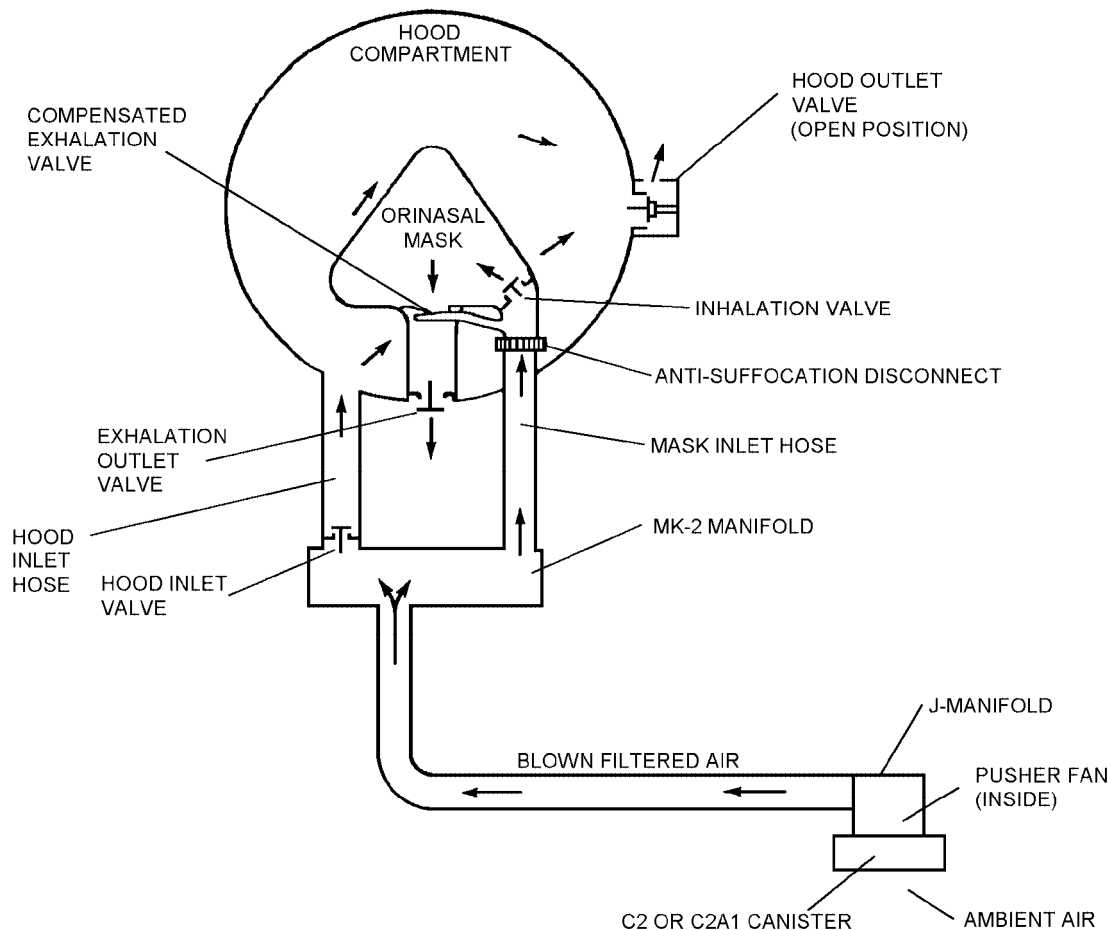


Figure 3-22. Connection of Drink Facility to Canteen

3-22

3-55. A/P37S-1 Intercom Set. The intercom set allows communications with another person via the second jack socket directly connected to that person's own intercom set. Also, by means of the transducer, communication can be established with any person not equipped with an intercom. With the toggle switch in the OFF position (away from the jack sockets), communication is possible between similarly equipped personnel, when both are plugged into the same unit. Operation of the A/P37S-1 Intercom Set, is as follows:

1. Moving the toggle switch to the MIC (center) position activates the microphone function of the transducer. The transducer will then transmit ambient sounds to the user.
2. Moving and holding the toggle switch towards the jack sockets activates the loudspeaker function of the transducer, enabling the user to speak to ground personnel who are not equipped with an intercom set. By moving the switch back to MIC position he can hear them.



3-23

Figure 3-23. MCK-3A/P Mask Air Flow Schematic

3-56. EMERGENCY OPERATION.

3-57. The A/P23P-14A(V) respirator assembly provides two methods of preventing suffocation, and obtaining access to UNFILTERED ambient air. Either the anti-suffocation disconnect can be disconnected or the faceplate ripaway feature utilized. Detailed information concerning these procedures, as well as emergency egress over water is contained in the aircraft NATOPS Emergency Procedures section. Refer to [figures 3-24](#) and [3-25](#).

3-58. Anti-Suffocation Disconnect.

1. Grasp connector with left hand.
2. Twist inward toward faceplate one-quarter turn clockwise, shearing brass shear screw, and unlocking connector.

3. Pull away to uncouple connector.

4. The anti-suffocation disconnect may then be reattached later, allowing the user to again breathe filtered air ([figure 3-24](#)).

3-59. Faceplate Ripaway.

NOTE

Once removed, the faceplate may not be reattached, but the microphone inside the faceplate may still be utilized.

1. Prior to attempting to use ripaway feature, visor and other helmet mounted equipment must be raised or removed.

2. Firmly grasp ripaway tab located under right cheek bone with right hand and pull straight out until tab breaks free from faceplate.

3. Continue pulling tab toward chin until tab ribbon completely separates from hood and faceplate (figure 3-25).

4. Release toggle harness from helmet mounted snaps.

5. Insert fingers of left hand into gap created by separating ribbon, grasp faceplate firmly and pull toward the left.

3-60. REFERENCE NUMBERS, ITEMS, AND SUPPLY DATA.

3-61. ILLUSTRATED PARTS BREAKDOWN. Section 3-5, Illustrated Parts Breakdown (IPB), lists and illustrates the detailed components of the Respirator Assembly. Figure and index numbers and reference or part numbers are provided for identification and procurement of replacement components. Source, Maintenance, and Recoverability codes are provided for procurable items.

Section 3-2. Modifications

3-62. GENERAL.

3-63. There are no modifications to the Respirator Assembly authorized at this time.

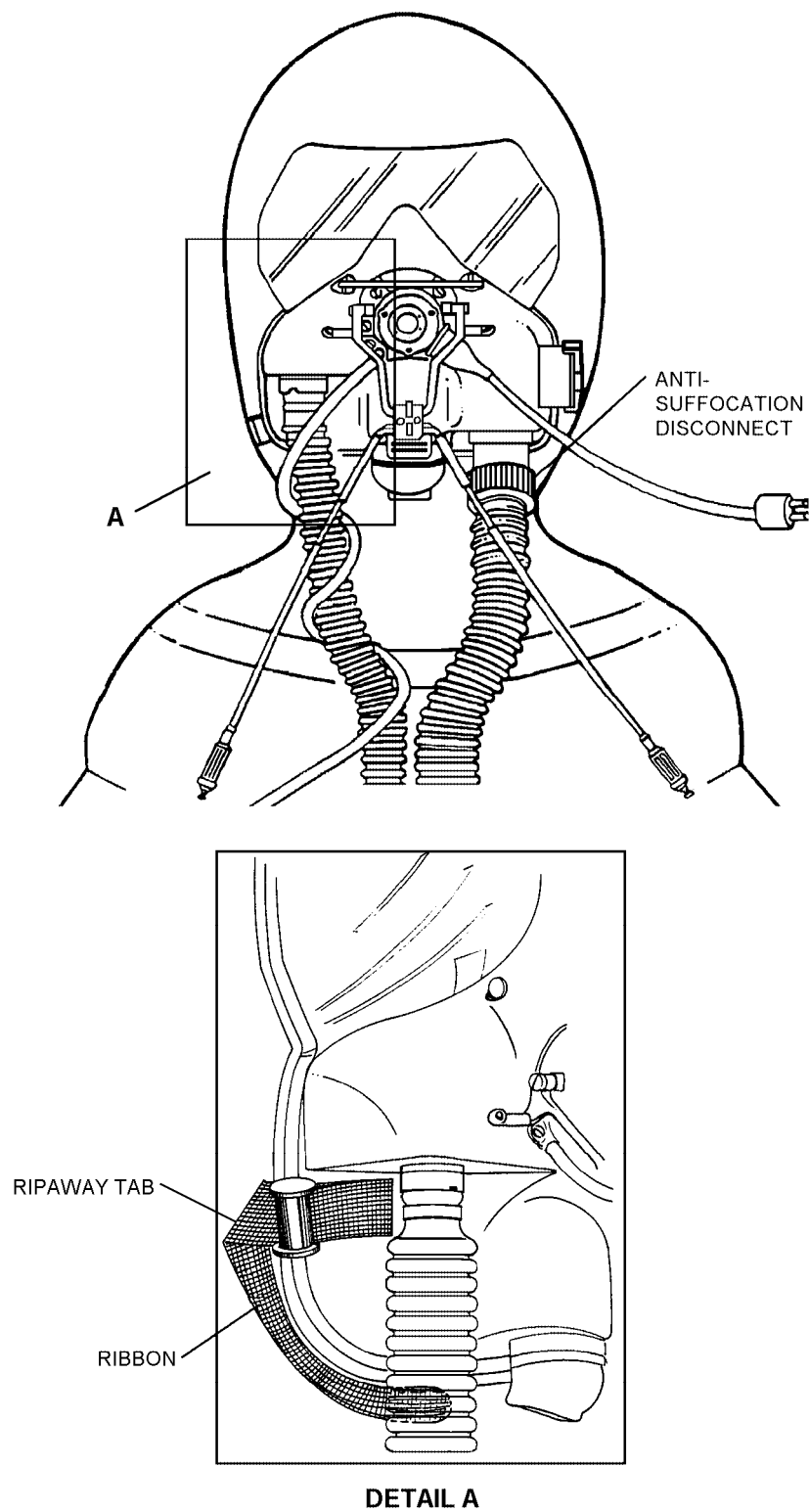
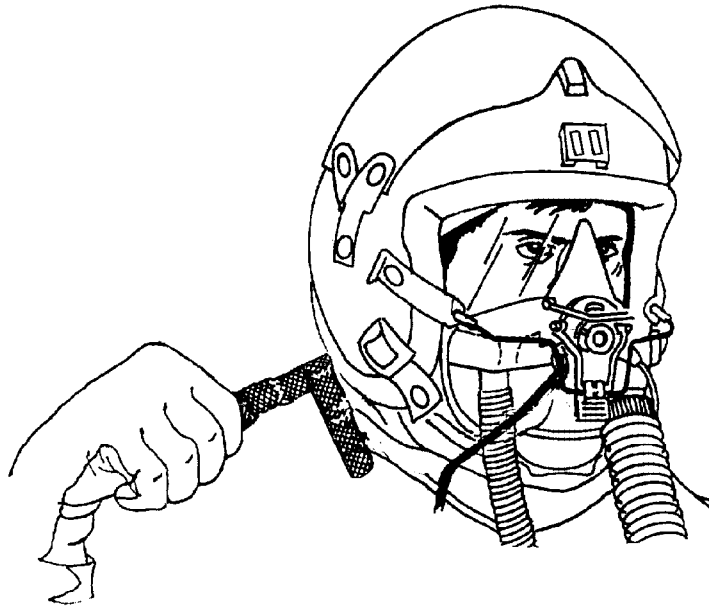


Figure 3-24. Emergency Ripaway Tab



STEP 1. LOCATE RIPAway TAB AND GRASP WITH RIGHT HAND.



STEP 2. PULL TAB UNTIL HOOD RIPS AND TAB RIBBON SEPARATES FROM HOOD.



STEP 3. UNSNAP CBR ADAPTER STRAPS.



STEP 4. PLACE FINGERS IN SLIT AND RIP FACEPLATE AWAY FROM FACE WITH LEFT HAND.

Figure 3-25. Anti-Suffocation Ripaway Procedure

Section 3-3. Fitting

3-64. GENERAL.

3-65. The concept of fitting refers to, and encompasses, sizing, fitting, and adjustment of the MCK-3A/P Mask and nose occluder. The procedures contained in this section shall be performed at the designated organizational maintenance level by a qualified Aircrew Survival Equipmentman (PR).

3-66. SIZING.

3-67. Procedures are provided in this section to fit the wearer with the proper orinasal mask, hood and nose occluder sizes.

3-68. PREPARATION OF COMPONENTS AND PROCEDURAL STEPS.

NOTE

To make up a complete assembly, the appropriate mask assembly and appropriate nose occluder kit must be individually requisitioned (see materials required).

Materials Required (Cont)

Quantity	Description	Reference Number
1	Kit, Nose Occluder, 6 mm long	CL 6566
1	Kit, Nose Occluder, 7 mm long	CL 6567
1	Kit, Nose Occluder, 4 mm short	CL 6568
1	Kit, Nose Occluder, 5 mm short	CL 6569
1	Kit, Nose Occluder, 6 mm short	CL 6570
1	Kit, Nose Occluder, 7 mm short	CL 6571

Materials Required

Quantity	Description	Reference Number
As required	Krytox, Type II, 240 AC	NIIN 00-961-8995
1	MCK-3A/P Mask Assembly (P Mask), Standard Hood	3297AS251-1
1	MCK-3A/P Mask Assembly (P Mask), Extra-large Hood	3297AS251-3
1	MCK-3A/P Mask Assembly (Q Mask), Standard Hood	3297AS251-4
1	MCK-3A/P Mask Assembly (Q Mask), Extra-small Hood	3297AS251-5
1	Kit, Nose Occluder, 4 mm long	CL 6564
1	Kit, Nose Occluder, 5 mm long	CL 6565

Support Equipment Required

Quantity	Description	Reference Number
1	Screwdriver, Jeweler's Head	—
1	Nut Driver, 1/8-inch	—

3-69. INITIAL FITTING, SIZING, AND ADJUSTMENT.

3-70. Mask Preparation. Preparation for fitting and use of the mask shall proceed as follows:

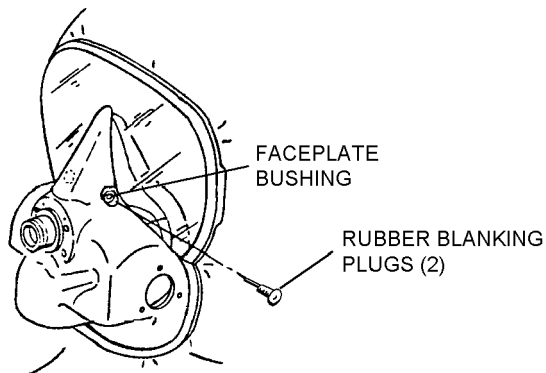
1. Remove selected mask from transit case and retain transit case.
2. Remove all packaging materials and coverings from mask except red colored servicing clip, which shall remain installed over faceplate ripaway tab. Ensure all hoses and valves are free from obstruction.
3. Verify orinasal mask size corresponds to part number on identification plate.

NOTE

Retain blanking plugs for future use, if removed.

If nose occluders are not available or val-salva capability is not critical, nose occluder blanking plugs, P/N CL 6131, shall remain installed.

4. If nose occluder is to be installed, remove rubber blanking plugs from nose occluder faceplate bushing in mask faceplate.



Step 4 - Para 3-70

3p70s4

3-71. Orinasal Mask Sizing.

1. Invert hood to expose orinasal mask.



Subject shall be careful not to tear neck seal when donning mask.

2. Instruct subject to hold orinasal mask to the face in its normal position with firm pressure. Cover the end of hose below manifold to prevent intake of air, and have the subject attempt to inhale deeply to test seal of orinasal mask to the face. If leakage is evident around orinasal mask edge, switch to larger or smaller size orinasal mask and retest.

3. Once subject is satisfied with the orinasal mask-to-face sealing, proceed with nose occluder fitting.

3-72. Initial Fitting of Nose Occluder. Table 3-1 provides the most practical method of selecting the proper nose occluder kit to fit the individual wearer. The table lists the available nose occluder kits, their dimensions, and the proportion of aircrew personnel using the individual kits. (For example, 75% of aircrew personnel requiring installation of a nose occluder used CL 6566). Begin the initial fitting process by using kit CL 6566, since that kit is most commonly used. If the kit does not fit properly, try the next most commonly used kit and continue the progression until a suitable fit is found. Each kit should contain the following:

5. Install rubber gasket, initially supplied with respirator, into J-manifold, ensuring it is fully seated in the groove and lies flat.

6. Verify securely attached installation of stepless low profile clamps securing hood and mask inlet hoses to MK-2 manifold, and manifold hose to MK-2 and J-manifolds.

Item Part	Part Number	Quantity
Shaft Assembly	As required	2
O-ring	Ref	4
Stirrup Assembly	Ref	1
C-clip	Ref	2
Facing Washer	Ref	2

Table 3-1. Nose Occluder Assembly

BOTTOM ROLLER COLOR A	NOSE OCCLUDER KIT	ARM LENGTH LONG OR SHORT	DIMENSION W	% USED
Brown	CL 6564	L	4 mm	1%
Red	CL 6565	L	5 mm	5%
Orange	CL 6566	L	6 mm	75%
Deep Cream	CL 6567	L	7 mm	5%
Green	CL 6568	S	4 mm	1%
Blue	CL 6569	S	5 mm	7%
Violet	CL 6570	S	6 mm	5%
Grey	CL 6571	S	7 mm	1%

CAUTION

When assembling nose occluder into mask, care should be taken not to force any parts together. Nose occluder and faceplate bushings which are in good working order should fit together snugly but easily. Bushings are black coated brass inserts which are press fitted into the faceplate and sealed with a silicone rubber sealant. Using excessive pressure could dislodge nose occluder faceplate bushings.

NOTE

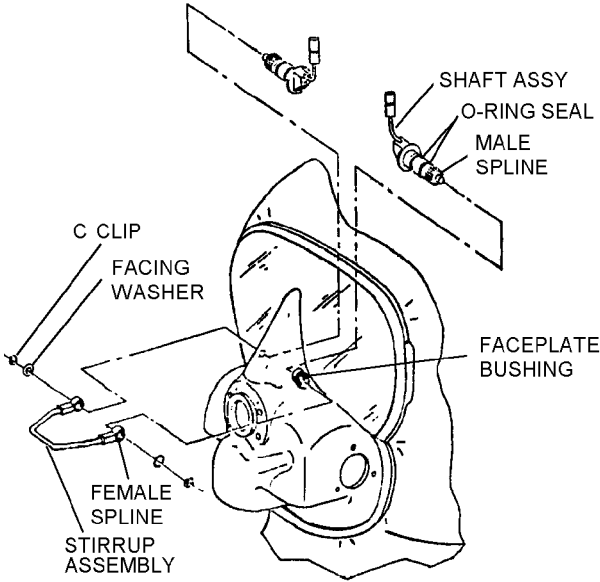
It is suggested that prior to assembling nose occluder in mask, the shaft assemblies and stirrup be engaged several times to remove any excess coating on splines. If the splines do not engage smoothly after this, they may be out of specification and should be replaced. Use Krytox sparingly to ensure that the shaft assembly splines will fit properly into the stirrup splines without excessive force.

There are no published repair procedures for either spline interference or faceplate bushings at this time.

1. After selecting proper nose occluder kit, before assembling nose occluder to stirrup assembly, apply Krytox lubricant to splined ends of nose occluder shaft assemblies (figure 3-26). Work splines of both

shaft assemblies in and out of stirrup assembly splines several times until the male splines engage smoothly with the female splines.

2. Inspect and lightly lubricate two O-ring seals on shaft assembly (figure 3-26).
3. Insert one shaft assembly through the inside of the faceplate bushing. Position roller portion of shaft assembly flush against inner side of faceplate nose bridge and then engage the splines. Repeat for opposite shaft assembly.



Step 3 - Para 3-72

3p72s3

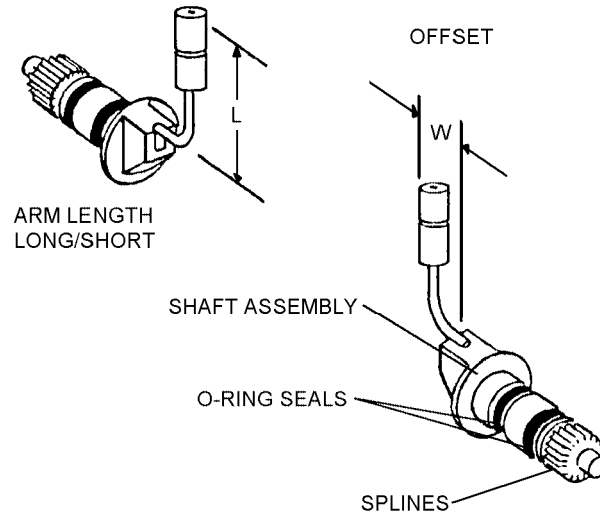


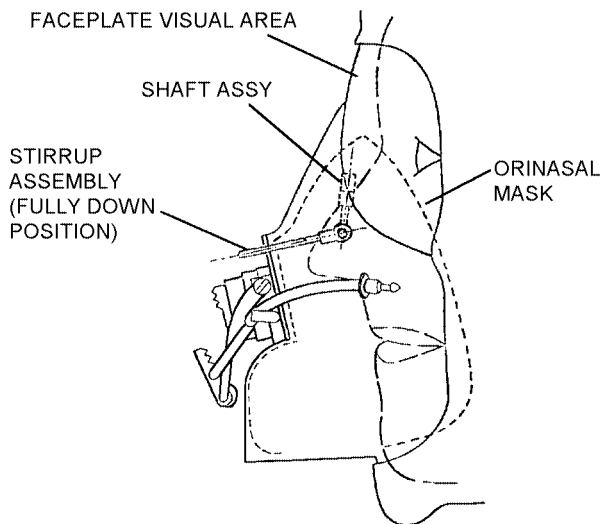
Figure 3-26. Nose Occluder Shaft Assemblies

3-26

4. Position stirrup assembly to be fully down onto outer portion of faceplate.

5. Maintain the relative positions of shaft assemblies and stirrup, then ease shaft assemblies through faceplate bushing to engage splines of the stirrups.

6. With hood inverted, instruct the subject to hold orinasal mask firmly to the face, simulating its normal position. Have subject raise stirrup assembly and valsalva by trying to expel air through the nose. Check for smoothness of operation, and ensure stirrup travel limits roller movement and not vice versa. If proper function is achieved, i.e. subject suitably valsalvas with no air leakage through the nose, proceed to [paragraph 3-74](#). If proper function is not achieved, proceed with [step 7](#).

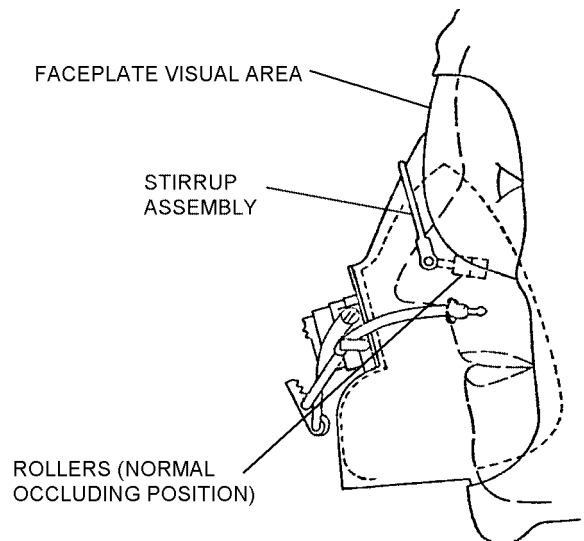


Steps 4 and 5 - Para 3-72

3p72s4

NOTE

Do not install washers or C-clips until paragraph 3-80.



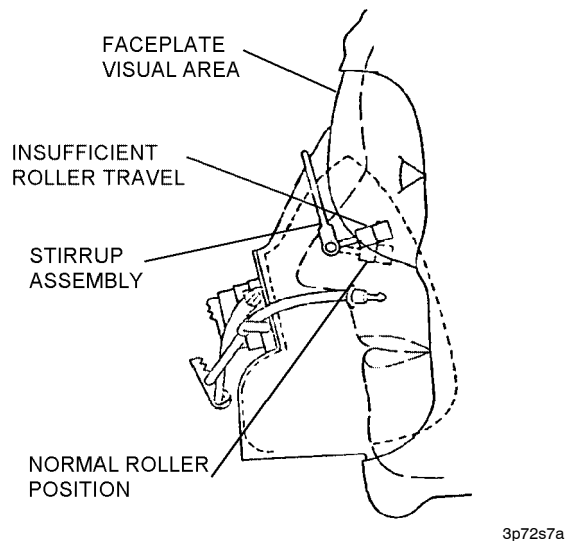
Step 6 - Para 3-72

3p72s6

NAVAIR 13-1-6.10

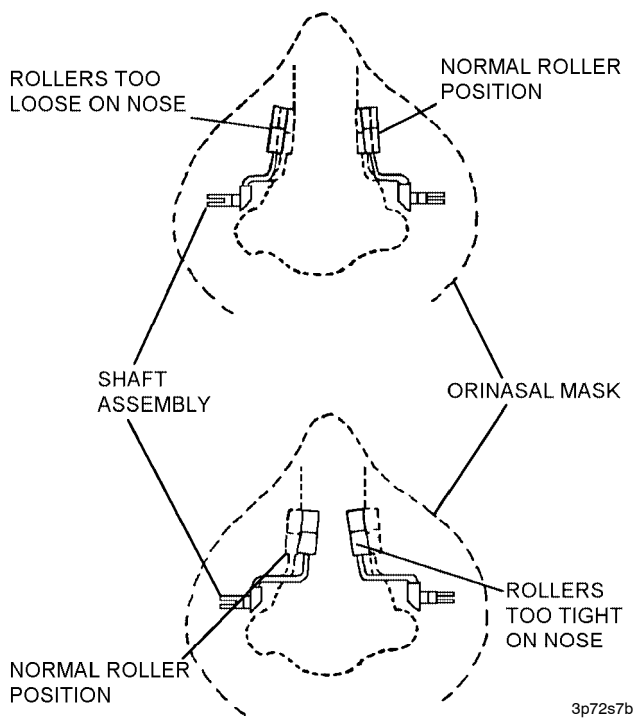
7. If leakage of air through the nose is evident, determine which of the following adjustments should be made and perform corrective action ([figure 3-27](#)).

a. Insufficient roller travel down the nose to occlude. Proceed to [step 8](#), Insufficient Roller Travel.



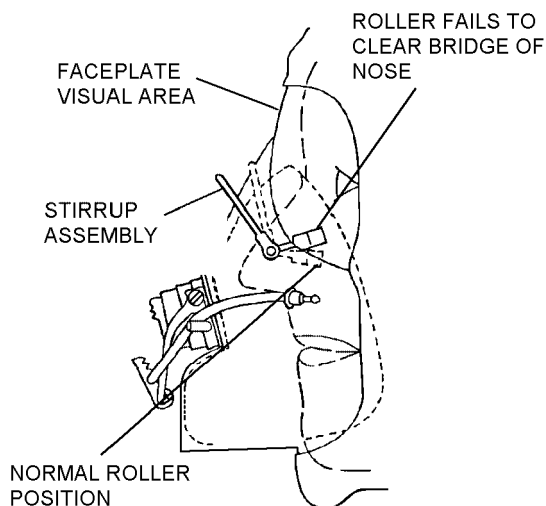
Step 7a - Para 3-72

b. Improper Roller Width; rollers pass in front of bridge of nose but are too tight or too loose for proper occlusion. Proceed to [step 9](#), Improper Roller Width.



Step 7b - Para 3-72

c. Improper roller arm length; rollers fail to clear bridge of nose, or are too far back on nose to properly occlude. Proceed to [step 10](#), Improper Roller Arm Length.



Step 7c - Para 3-72

NOTE

If excessive spline adjustments are made, discomfort to wearer may result due to pressure exerted on the nose by occluder in its resting position.

8. Insufficient Roller Travel: If roller travel is at fault, more travel is necessary to achieve proper occluding position; a slight spline adjustment away from orinasal mask nose bridge is necessary. Adjust and repeat [step 6](#). If, after several spline adjustments, more pressure on the nose is necessary and/or wearer experiences discomfort due to pressure exerted by the rollers in their resting position, select a nose occluder kit of the same arm size, larger offset. Repeat [steps 2 through 6](#). Once the subject becomes satisfied with the performance and comfort of the nose occluder, proceed with [paragraph 3-74](#).

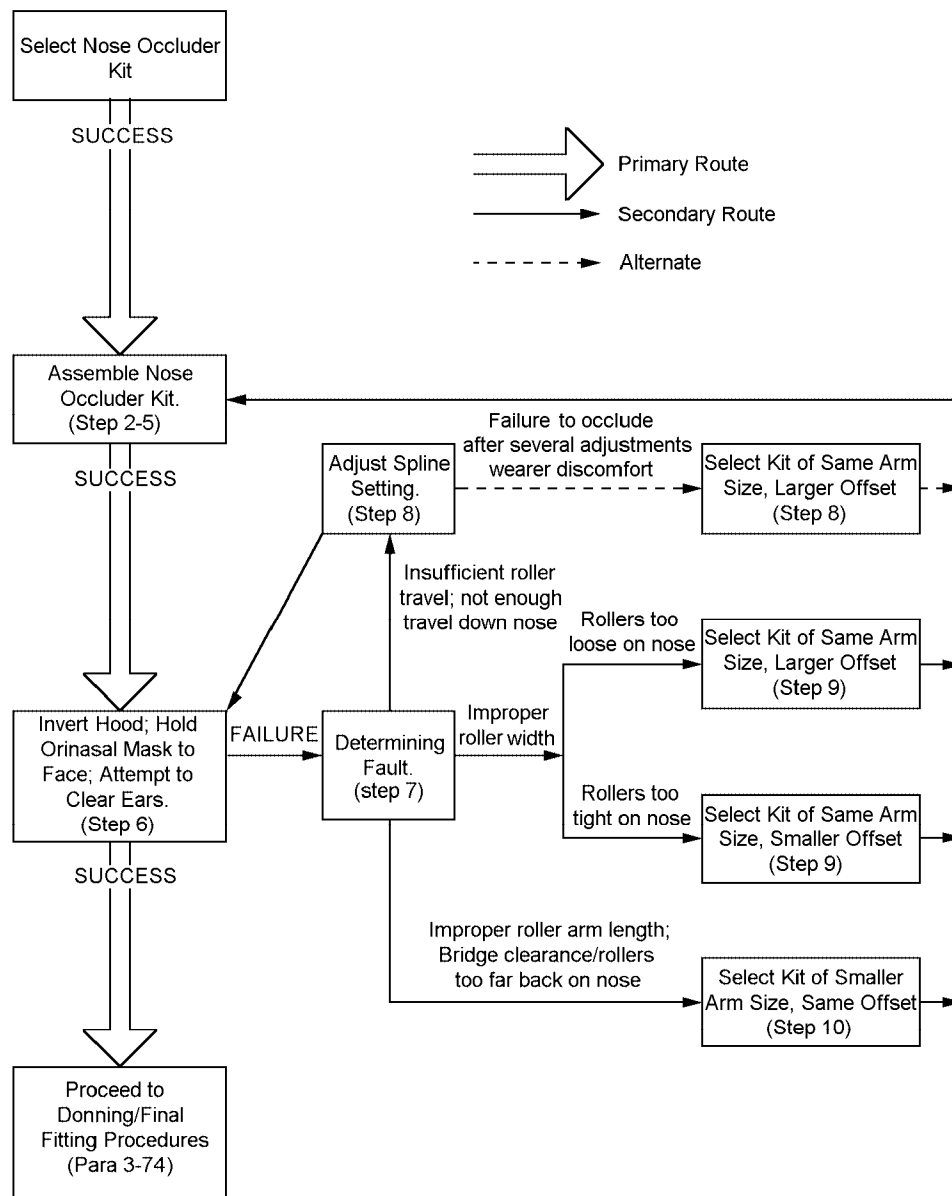


Figure 3-27. Nose Occluder Fitting Flow Diagram

9. Improper Roller Width: If the distance between rollers is at fault and the rollers are too loose on nose (in the occluding position), select a kit of the same arm size, with a larger offset. If partial occlusion was achieved but the rollers are too tight on the nose, select a kit of same arm size with a smaller offset. Repeat [steps 2 through 6](#). Once subject becomes satisfied with performance and comfort of the nose occluder, proceed with [paragraph 3-74](#).

10. Improper Roller Arm Length: If rollers seat too far back on the nose, or are blocked by the bridge of the nose upon occlusion, select a kit of smaller arm size, same offset. Repeat [steps 2 through 6](#). Once subject becomes satisfied with the performance and comfort of the nose occluder, proceed with [paragraph 3-74](#).

3-73. FINAL FITTING AND ADJUSTMENT.

3-74. Donning for Fitting. Donning of the respirator assembly shall be supervised by a qualified Aircrew Survival Equipmentman (PR), and shall proceed as follows:

NOTE

The pusher fan must be assembled to the manifold hose on the MCK-3A/P mask and MK-2 manifold assembly prior to donning the system for fitting. Assembly instructions are provided in [paragraph 3-208](#).

1. Have subject don appropriate Survival Vest in accordance with NAVAIR 13-1-6.7 Series.

2. Subject shall don skull cap, head band, etc., if so desired. These items are recommended to improve comfort and to keep perspiration out of the eyes.

3. Turn pusher fan on.



Be careful not to tear neck dam when donning mask.

4. Holding skull cap in place, instruct subject to place hands inside neck seal with palms together and pull open. Slide down over head. Adjust mask for comfort and good visibility.

5. Assist wearer in seating mask neck seal, ensuring neck seal is not rolled-up and lies flat. Ensure hood outlet valve is open.

6. Turn pusher fan off.

7. Subject shall don helmet (see NAVAIR 13-1-6.7-3 manual for information on applicable helmets) and tighten and secure chin strap.

8. Turn pusher fan ON.

9. Subject shall connect helmet adapter strap snap to eyelet studs on helmet as shown in [figure 3-28](#).

NOTE

Toggle harness cables shall lie over hooks on faceplate front, with V-bow in the up position.

10. Flip V-bow down into flight position, and adjust swivel link for proper tensioning.

NOTE

Adjustment of toggle harness assembly is made by rotating adjustable swivel link. It may be necessary to flip toggle plate in the down position for proper tensioning.

11. With filtered air supply flowing, clamp hood inlet hose by application of slight finger and thumb pressure. Request wearer to hold breath, and test adequacy of orinatal mask-to-face sealing. If air is felt leaking out from edge of orinatal mask, further adjustment of toggle harness assembly should be made and the orinatal mask-to-face seal retested. If on re-test leakage is still evident, replace with a smaller or larger size orinatal mask.

3-75. Final Fitting of Nose Occluder. Instruct subject to raise stirrup and attempt to clear the ears. In some cases there will be a tendency for faceplate to lift slightly as user attempts to pass rollers over the bridge of the nose. This may be accompanied by failure of rollers to pass over the bridge, and thus interfering with their effective downward travel; both conditions can prevent proper occlusion. However, these effects usually may be overcome by instructing subject to hold and force faceplate down with thumb and three fingers, while using index finger to raise stirrup assembly. If unsuccessful, refer to [paragraph 3-72, step 6](#).

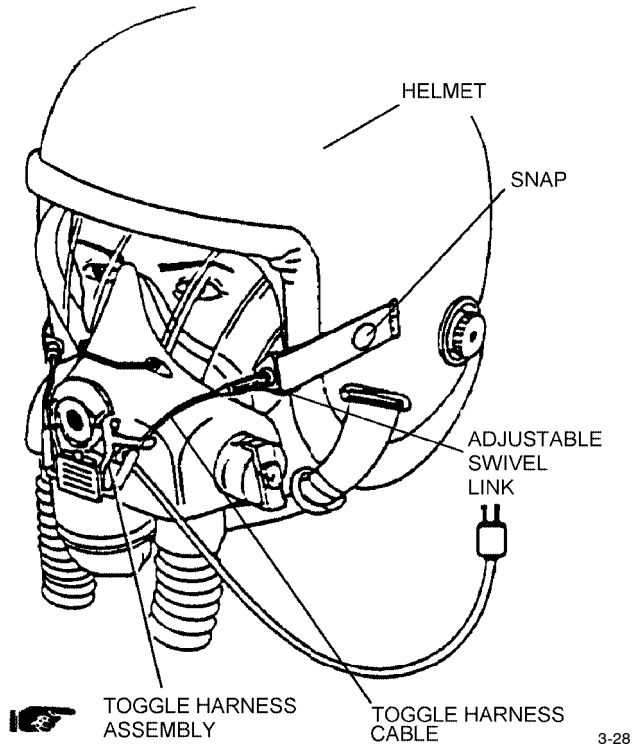
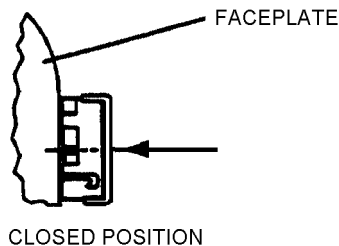
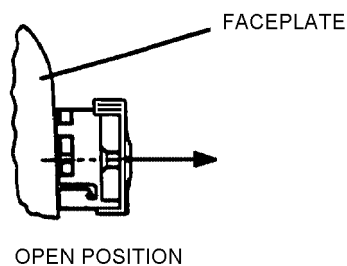


Figure 3-28. Connection of Toggle Harness Assembly to Helmet

3-76. WEARER FAMILIARIZATION PROCEDURES.

3-77. Hood Outlet Valve Familiarization.

1. Request user to operate hood outlet valve from the open to closed position and back to open position by pulling and rotating hood outlet valve lever as illustrated.



Step 1 - Para 3-77

3p77s1

2. The cycle from open to closed and return to open is to be repeated until aircrewmember is satisfied with operation of valve.

NOTE

Valve shall be in its open position for normal flight operation.

WARNING

If pusher fan fails to operate in a contaminated environment or if aircrewmember is immersed in water, close valve.

3-78. Anti-Suffocation Disconnect Familiarization.

1. Remove and retain brass shear screw.

2. Request aircrewmember to uncouple (clockwise rotation) and then withdraw anti-suffocation disconnect from the mask inlet adapter.

NOTE

The cycle of connecting and reconnecting anti-suffocation disconnect is to be repeated until aircrewmember is satisfied as to orientation and operation of the anti-suffocation disconnect facility.

3. At final reconnection of the anti-suffocation disconnect, ensure mask inlet hose is not twisted.

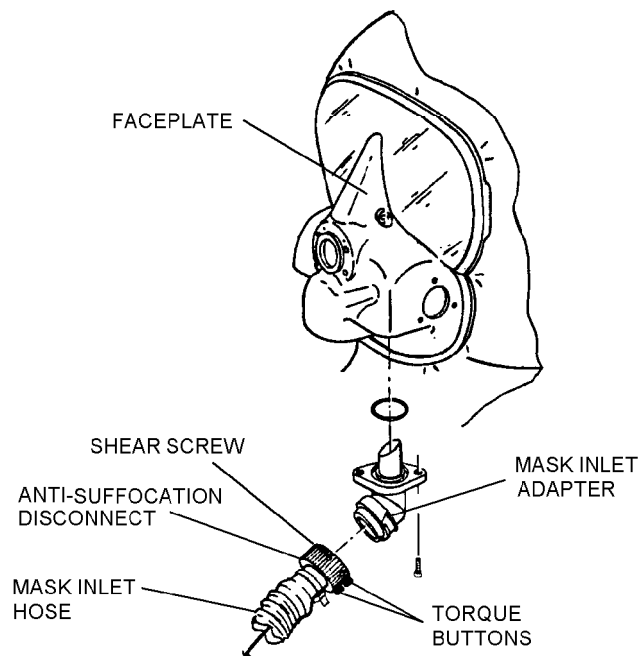
WARNING

Ensure shear screw is installed.

4. Fit shear screw (brass) to lock connector.

5. Apply a slight twisting motion to connector to assure shear screw engages edges of locking slot machined in mask inlet adapter.

6. Examine the mask inlet adapter, particularly for damage and security of attachment.



Step 6 - Para 3-78

3p78s6

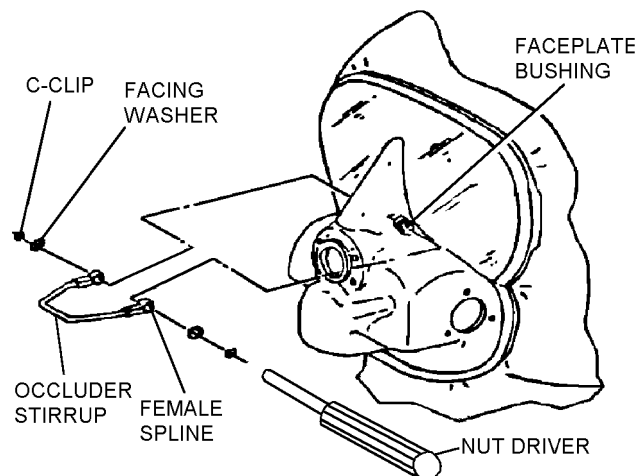
3-79. DOFFING AFTER FITTING. After fitting, have subject remove respirator assembly as follows:

1. Disconnect helmet adapter straps from helmet studs.
2. Assist wearer to doff his protective helmet.
3. Assist wearer to doff mask, being careful not to disturb or dislodge the (as-yet unlocked) nose occluder components.
4. Switch the pusher fan OFF.
5. Remove survival vest.

3-80. LOCKING STIRRUP ASSEMBLY. Lock stirrup assembly in position by applying appropriate washers and C-clips to external end of each shaft assembly. For ease of C-clip installation, proceed as follows:

1. Ensure the stirrup assembly is in the down position. If right handed, use left hand inside of mask to support shaft assembly during C-clip installation, vice versa if left handed.

2. Ensure the shaft assembly is completely seated through stirrup end. Place washer on shaft end and ensure C-clip groove is visible with washer in place.



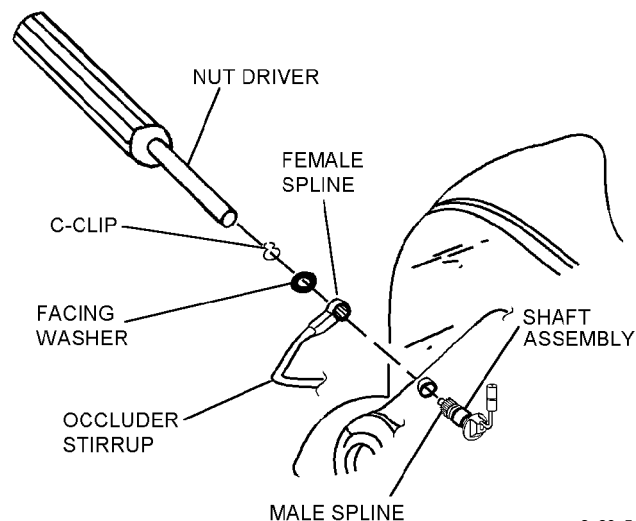
Step 2 - Para 3-80

3p80s2

3. Apply Krytox to the end of a 1/8-inch nut driver. Krytox will serve as an installation lubricant and will hold C-clip in place on the nut driver.

4. Place C-clip on end of nut driver and adjust C-clip to be centered over the nut driver opening.

5. Line up 1/8-inch nut driver directly over center of shaft end and press C-clip into groove. Verify C-clip is properly seated.



Step 5 - Para 3-80

3p80s5

6. Repeat steps 1 thru 5 for opposite side.

7. After fitting is complete, clean mask assembly in accordance with paragraph 3-92.

Section 3-4. Maintenance

3-81. GENERAL.

3-82. This section contains procedural steps for inspecting, testing, troubleshooting, disassembling, cleaning, repairing, and assembling the A/P23P-14A(V) Respirator Assembly.

3-83. INSPECTIONS.

NOTE

Only a small quantity of respirator assemblies shall be opened or removed for in-flight proficiency training and for fitting aircrew. Training masks may be rotated among aircrewmembers when properly cleaned in accordance with this manual to maintain proper hygiene. The remaining quantities will be permanently stored in their transit cases inside the sealed bag. If the plastic bags can no longer be partially vacuum packed and heat sealed in their original condition, refer to Storage in [Chapter 2](#). Inspections do not need to be performed unless the masks are removed from storage and placed in service for contingency in-flight or training missions. Respirators that have been removed from their sealed plastic bag and are in the Calendar Inspection cycle may be vacuum packed and resealed in a plastic or foil bag and removed from all inspection cycles during long term storage.

3-84. PLACE-IN-SERVICE INSPECTION. The Place-In-Service Inspection shall be performed by a qualified Aircrew Survival Equipmentman (PR). The inspection shall include Visual Inspection, battery charging (NiCad battery only), cleaning of the internal surfaces, functional checks and bench testing of all assemblies and their component parts where specified. Visual Inspection, battery charging, and cleaning of the internal surfaces shall be performed at Organizational Maintenance Level (O-Level). Bench testing shall be performed at the Intermediate Maintenance Level (I-Level). For Rapid Deployment Forces (RDF), all testing will be performed at O-Level. An appropriate OPNAVINST 4790.2 Series form will be issued for each respirator and each intercom set.

Materials Required

Quantity	Description	Reference Number
As Required	Pad, Gauze	—
As Required	Water	—

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Cloth, Cotton	—
As Required	Cloth, Abrasive	—
As Required	Cleaning Compound Type I	MIL-C-43616
As Required	Towelettes, SANI-COM	No. 3205 (CAGE 18195)
As Required	Bleach, Laundry	A-A-1427 NIIN 00-598-7316
1	Brush, Sable	—
1	Brush, Acid	NIIN 00-514-2417
As Required	Swab, Cotton	—
As Required	Alcohol, Isopropyl Rubbing	TT-I-735 NIIN 00-655-8366
As Required	Cloth, Chamois	—
1	Cable Tie, 3.6 mm	CL 6226

Support Equipment Required

Quantity	Description	Reference Number
1	Cable Tie Tool	NIIN 00-937-5438
1	Pliers, Side Cutting, 4-inch	—
1	Screwdriver	—
1	Pincer Tool, Low Profile	Oetiker 14100055
	or	
1	Pliers, Hose Clamp	NIIN 01-073-4187

3-85. Unpacking Transit Case.

1. Unpack transit case as follows (refer to [figure 3-18](#)):

- Cut open plastic storage bag.
- Remove and retain silica gel desiccant.
- Remove transit case from storage bag. Retain bag for future use.
- Remove mask from transit case.
- Check the transit case packing list to confirm all items are included.

2. Document in accordance with OPNAVINST 4790.2 Series.

CAUTION

When performing maintenance on the respirator assemblies, avoid pulling on rip-away tab assembly. Keep red servicing clip in place during all handling.

3-86. Visual Inspection.

3-87. Mask Assembly. Inspect the mask assembly as follows:

CAUTION

Avoid excessive stretching of neck seal when inverting hood to inspect internal components. Damaged neck seals may not be repaired nor replaced.

1. Hood, apron and neck seal for damage, deterioration and security of bonded joints. Invert hood to inspect internal seams.

2. Inhalation valve for freedom from obstruction. Remove iceguard and inspect stepped rubber valve for dirt or signs of obstruction. Ensure it is properly oriented per [paragraph 3-196](#).

3. Iceguard for damage and blockage. Refit per [paragraph 3-196](#).

4. If nose occluder is installed, check shaft assemblies on nose occluder for damage and security of attachment.

5. Orinasal mask for damage and deterioration to face sealing edge, and area contacted by shaft assemblies of nose occluder.

6. Orinasal mask inhalation duct connection to mask inlet adapter. Check cable tie for security of attachment ([figure 3-29](#)).

7. Orinasal mask deflector plate for damage, security of attachment, and correct positioning on orinasal mask.

8. Ensure compensated exhalation valve is free from obstruction by gently depressing metal valve plate using a non-metallic probe. Release valve plate. Inspect valve for security within orinasal mask housing.

9. Inner face of hood outlet valve for freedom from obstructions.

10. Hood-to-faceplate sealing strip and padding strip for damage, deterioration, and security of bonded joints.

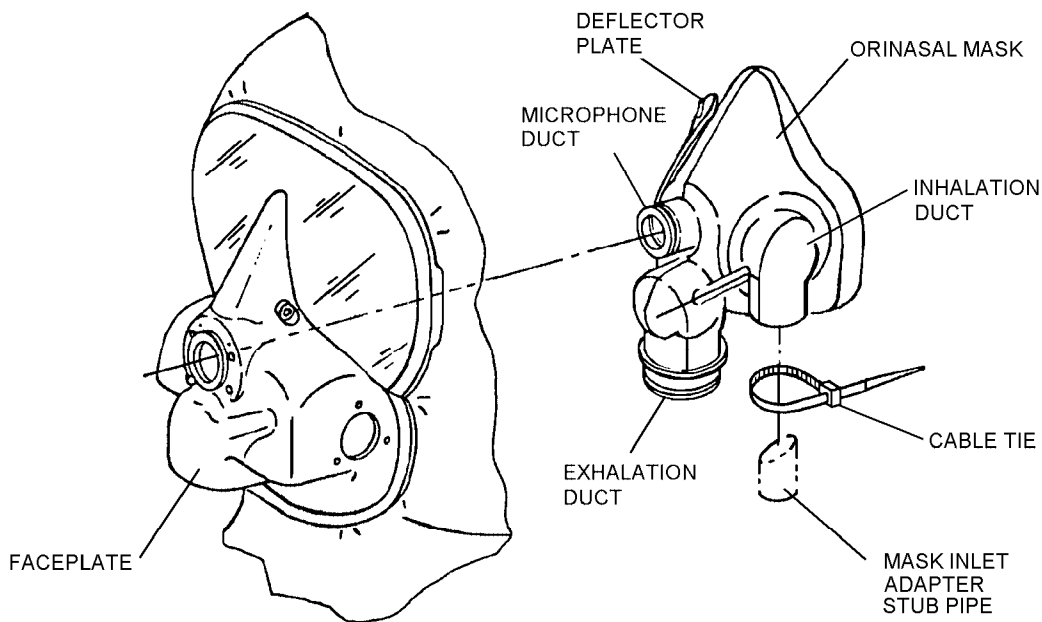


Figure 3-29. Faceplate/Orinasal Mask Cable Tie Installation

11. Inside portion of hood inlet adapter for damage, security of attachment, and freedom from obstruction. Carefully restore hood to normal position.

12. Toggle harness assembly and faceplate for damage and security in vicinity of mask harness attachment screws. Check all harness assembly nuts, screws, cables, and connector links. Inspect for security and attachment of cable assemblies, toggle plate, and helmet adapter straps.

13. If nose occluder is not installed, ensure rubber blanking plugs are installed and fully seated in faceplate nose occluder bushings.

14. Microphone connecting lead for damage, deterioration, fraying, and security of attachment.

15. Anti-suffocation disconnect and mask inlet adapter for obvious damage and security of attachment.

a. Remove brass shear screw and ensure it has not been sheared.

b. Disengage anti-suffocation disconnect from the mask inlet adapter.

c. Check anti-suffocation disconnect O-ring for damage.

d. Check ferrule for damage and attachment of the restraint cord.

e. Reconnect anti-suffocation disconnect to mask inlet adapter and reinstall brass shear screw. Ensure mask inlet hose is not twisted or kinked.

16. Hood inlet hose for damage, deterioration, and security of attachment.

17. MK-2 manifold assembly for damage.

18. Drink facility for damage and security of attachment.

3-88. Pusher Fan Subassembly. Inspect the pusher fan subassembly as follows:

1. Pusher fan body for signs of rips, tears, or damage.

2. Power cord for loose or corroded ends.

3. Obtain a RFI (Ready-for-Issue) Battery (refer to [Chapter 6](#)).

a. If a new battery is required, conduct the Place-in-Service Inspection in accordance with [Chapter 6](#).

b. If a RFI battery is going to be used, conduct a visual inspection and functional check.

3-89. A/P37S-1 Intercommunications Set. Inspect the A/P37S-1 Intercommunications Set as follows:

1. Ensure no mechanical damage, cracks or dents are found on intercom unit.

2. Communication cord and patch cord shall have no frayed wires, corroded pins or receptacles.

3. Ensure battery is not leaking fluid or any other substance.

4. Ensure mechanical integrity of intercom unit by checking for loose knobs, loose hardwire jack connection or a broken spring clip.

3-90. Battery Charging (NiCad only). Refer to [Chapter 6](#) for battery charging, discharging, storage and troubleshooting.

3-91. Bench Testing. Perform bench test on MCK-3A/P mask in accordance with [paragraph 3-111](#).

3-92. Cleaning. The MCK-3A/P mask assembly shall be cleaned following fitting or operational use. Cleaning shall be accomplished by a qualified Aircrew Survival Equipmentman (PR) using the following procedures.

Materials Required

Quantity	Description	Reference Number
As Required	Pad, Gauze	—
As Required	Water	—
As Required	Cloth, Cotton	—
As Required	Towelettes, SANI-COM	No. 3205 (CAGE 18195)
As Required	Bleach, Laundry	A-A-1427 NIIN 00-598-7316
1	Brush, Sable	—
As Required	Alcohol, Isopropyl Rubbing	TT-I-735 NIIN 00-655-8366
As Required	Swab, Cotton	—
As Required	Cloth, Chamois	—
1	Cable Tie 3.6 mm	CL 6226

Support Equipment Required

Quantity	Description	Reference Number
1	Cable Tie Tool, Standard	MS90387-1
1	Canteen	NIIN 01-118-8173
1	Canteen Cap, M-1	NIIN 00-930-2077
1	Pliers, Side Cutting, 4-inch	—



Avoid excessive stretching of the neck seal when inverting hood to inspect internal components. Damaged neck seals may not be repaired nor replaced.

1. Invert hood and carefully fold inside out to expose orinasal mask.
2. Clean inner hood.
 - a. Clean internal surfaces of hood using a clean gauze pad moistened with water.
 - b. Wipe excess water from hood with a clean, dry cotton cloth and allow to air dry.



Excessive dirt, sand, dried liquid nourishment, or vomit in mask assembly can degrade protection against CB agents.

3. Inspect interior of mask assembly. If excessive dirt, sand, dried liquid nourishment, or vomit is observed in mask assembly, mask shall be disassembled and all component parts cleaned in accordance with paragraph 3-156. If internal compartments of valves or hoses cannot be thoroughly cleaned, they shall be replaced.



Do not clean inhalation or exhalation valves with SANI-COM towelettes or sanitizing solution.

NOTE

If SANI-COM No. 3205 Cleansing Towelettes are not available, clear water may be used instead.

4. Clean orinasal mask.

- a. Clean internal surfaces of orinasal mask with cleansing towelettes (SANI-COM No. 3205) being sure to wipe under the rolled-over edges of orinasal mask. An alternate cleaning procedure is to moisten a gauze pad with clear water and squeeze to remove excess to prevent dripping. Wipe interior of mask, exclusive of valves, being sure to wipe under the rolled-over edges of orinasal mask.

- b. Wipe microphone with a towelette or moistened gauze pad.

- c. Allow to air dry.

5. Clean inhalation valve.

- a. Turn iceguard 90° and lift it from the inhalation valve assembly.

- b. Gently lift valve with finger and clean underside of valve and valve seat with a sable brush moistened with water.

- c. Clean top of valve in the same manner.

- d. Allow to air dry.

- e. Clean iceguard with a sable brush and water to remove any foreign particles from the mesh.

- f. Allow to air dry.

- g. Reinstall iceguard by engaging two tabs on iceguard and turning it 90° so that arrow points toward exhalation valve. Ensure iceguard is fully seated.

CAUTION

Do not attempt to clean movable plate in center of compensated exhalation valve with a cotton swab. The valve plate is delicate, and lint from cotton swab may become lodged in valve. For detailed cleaning of compensated exhalation valve, see [paragraph 3-164](#).

6. Clean compensated exhalation valve.

a. Clean exposed plastic area of compensated exhalation valve using a sable brush or cotton swab moistened with water. If valve is excessively dirty, isopropyl alcohol may be used. Ensure no lint or brush hairs remain in exhalation valve.

b. Clean movable plate in center of valve using a sable brush moistened with water or isopropyl alcohol.

c. Allow to air dry.

CAUTION

Abrasive cleaners, adhesives, and solvents must not be applied to visual areas of faceplate. Velveteen covers are not to be used for cleaning or polishing.

Damage or scratches to faceplate cannot be repaired. Use care when cleaning faceplate.

7. Clean inner surface of faceplate.

a. Clean inner visual area of faceplate using water with soft cotton cloth or dampened chamois.

b. Wipe faceplate with clean, dry cotton cloth to remove excess water.

c. Allow to air dry.

8. Clean canteen and drink facility.

CAUTION

Do not allow sanitizing solution to come into contact with inside of faceplate.

a. Prepare sanitizing solution by mixing 1 tablespoon of laundry bleach with 2 quarts of water. Pour half of the sanitizing solution into two quart canteen.

b. Attach canteen to drink facility quick disconnect.

c. Position a plastic bowl or another suitable container to catch sanitizing solution, then invert canteen and squeeze to force sanitizing solution through drink facility until canteen is empty.

d. Disconnect canteen from drink facility quick disconnect.

e. Fill canteen half way with clean water and connect to drink facility quick disconnect. Invert canteen and squeeze to force clean water through drink facility until canteen is empty.

f. Disconnect canteen from drink facility quick disconnect.

g. Connect a dry canteen to drink facility quick disconnect. Squeeze canteen to force any remaining water out of drink facility.

h. Disconnect canteen from drink facility quick disconnect.

9. Restore hood to normal position.

10. Clean external surface of faceplate visual area in same manner as [step 7](#).

11. Clean exhalation outlet valve.

a. Remove snout to expose exhalation outlet valve ([paragraph 3-130](#)). Cut cable tie and ease snout from ring nut of exhalation outlet valve holder.

b. Grasp the raised rubber knob at valve center and pull valve off its seating pin.

c. Clean both sides of valve, and valve seat using a sable brush moistened with water.

d. Set valve aside to air dry with knob side of valve facing down on bench. Allow valve seat area to air dry.

e. Reinstall valve on seating pin, ensuring it is fully seated on pin.

f. Reinstall snout over ring nut of exhalation outlet valve holder ([paragraph 3-200, step 3](#)).

(1) Position 3.6 mm black cable tie around snout with locking head to right of snout.

(2) Secure cable tie using cable tie tool set to INT position.

12. Clean outer hood.

a. Wipe external surface of hood using a clean gauze pad moistened with water.

b. Wipe excess water from hood with a clean, dry cotton cloth and allow to air dry.

13. Refit velveteen cover.

a. Inspect velveteen cover for dirt and abrasive particles.

b. Ensure velveteen side is folded inward and reinstall cover over visual area of faceplate.

NOTE

Rubber products have a natural memory, and may develop permanent wrinkles or folds over a period of time when stored wrinkled or folded.

14. Carefully place MCK-3A/P and pusher fan sub-assembly in its transit case with as few folds and wrinkles as possible. Secure with retaining straps as illustrated on the transit case lid (refer to [paragraph 3-93](#)).

3-93. Transit and Ready-for-Use Storage. To prepare the MCK-3A/P and pusher fan subassembly for transit or ready-for-use storage, proceed as follows:

- 1. Fit velveteen cover, ensuring correct position on the faceplate.
- 2. Ensure stirrup assembly is in its downmost position (when fitted).
- 3. Ensure red servicing clip is installed over rip-away tab.
- 4. Place mask face-up in transit case, ensuring toggle harness and microphone cord are positioned away from optical areas.
- 5. Carefully fold hood in and around faceplate, ensuring all hoses lie flat and are free from kinks.
- 6. Secure with retaining straps as illustrated on transit case lid.

3-94. PREFLIGHT INSPECTION. The Preflight Inspection shall include a general spot check to ensure A/P23P-14A(V) Respirator Assembly is clean and operating properly. The Preflight Inspection shall be performed before each flight by aircrew personnel. To perform Preflight Inspection, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Pad, Gauze	—
As Required	Towlettes, SANI-COM	No. 3205 (CAGE 18195)
As Required	Water	—
As Required	Cloth, Cotton	—
As Required	Cloth, Chamois	—
As Required	Cloth, Abrasive	—
As Required	Brush, Acid	NIIN 00-514-2417
As Required	Cleaning Compound Type I	MIL-C-436116
As Required	Anti-Fogging Kit	NIIN 00-127-7193

3-95. Visual Inspection.

3-96. MCK-3A/P Mask Assembly. Inspect mask assembly as follows:

- 1. If nose occluder is not installed, ensure blanking plugs are installed and fully seated in faceplate nose occluder bushings.



Avoid excessive stretching of neck seal when inverting hood to inspect internal components. Damaged neck seals may not be repaired nor replaced.

- 2. Carefully fold hood inside out to expose orinal mask.



Presence of foreign matter in mask may degrade its performance and subject wearer to contamination.

- 3. Inspect for presence of foreign matter. If foreign matter is present, mask shall be thoroughly

cleaned before use in accordance with [paragraph 3-92](#).

4. Clean inner lens area in accordance with [paragraph 3-92](#) and allow to dry completely. When dry, apply anti-fogging compound to lens and allow to completely dry. Return hood to its normal position.

5. Inspect toggle harness for security of attachment and proper operation.

6. Clean outer lens area in accordance with [paragraph 3-92](#) and allow to thoroughly dry. Apply anti-fogging compound to outer lens and allow to dry.

3-97. Lower Assembly. Inspect lower assembly as follows:

1. Inspect MK-2 manifold for damage.

2. Inspect pusher fan subassembly as follows:

a. Ensure both ends of manifold hose are secured with stepless low profile clamps; one to the MK-2 manifold right-side inlet port and one to the J-manifold. Carefully check the hose for damage.

b. Remove and inspect J-manifold gasket and inspect for damage. Reinstall.

c. Inspect C2 or C2A1 canister for obvious damage. Ensure C2 or C2A1 canister is securely fastened to J-manifold (fully hand-tightened).

d. Inspect pusher fan for signs of rips, tears, or obvious damage. Check fan operation. Rotate the electrical cord at both battery terminal and pusher fan junction.

e. Position pusher fan on filter canister so that it is oriented with the intake uppermost as in [figure 3-15](#). Secure in place with a cable tie.

3. Inspect battery as follows:

a. Case for swelling, cracks, leaks, or contamination.

b. Receptacle for corrosion or other damage.

c. Missing fuse extractor knob (NiCad only).

3-98. Intercommunications Unit. Inspect intercommunications unit as follows:

1. Ensure no cracks, dents or mechanical damage is found on intercom unit.

2. Communication cord and patch cord shall have no frayed wires, corroded pins or receptacles.

3. Ensure 9V battery (NIIN 01-900-2139) is not leaking fluid or any other substance.

4. Ensure mechanical integrity of intercom unit by checking for loose knobs, loose hardwire jack connection or a broken spring clip.

5. Perform functional check in accordance with the following:

a. Connect intercom unit to mask microphone and aircrew helmet with the ground communications cord as indicated in [table 3-1A](#) and [figure 3-30](#).

b. Switch intercom unit toggle to the MIC position.

c. Talk into intercom unit and have aircrew confirm sound in helmet earphones.

d. Switch and hold toggle to the SPKR position.

e. Instruct aircrew to talk and confirm sound coming from intercom transducer.

f. If the intercom unit fails the functional check, replace intercom unit and repeat [steps a thru e](#).

g. Switch toggle back to the OFF position and secure intercom unit to the survival vest.

3-99. Functional Test of Respirator Assembly.

1. Have aircrew don respirator assembly with pusher fan ON.

2. Perform functional test as follows:

a. Close hood outlet valve.

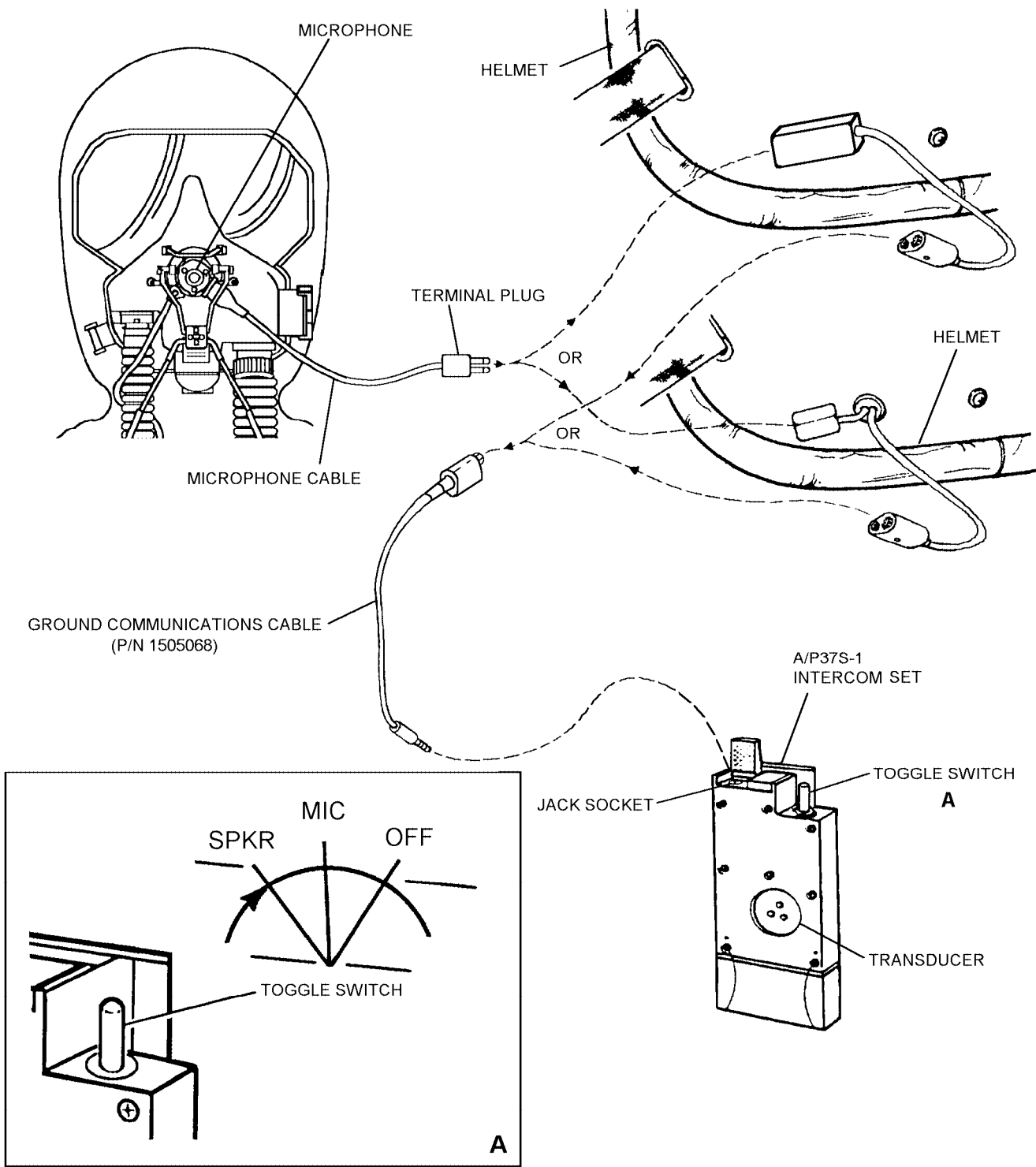


Figure 3-30. Communication System Interconnect

Table 3-1A. CBR Communications Cords

Priority Aircraft	CBR Mask	Helmet	Helmet Connector	CBR Communications Cord		Amp (Note 2)
				Ground (Note 1)	In-flight	
CH-46D	A/P23P-14A(V)	HGU-84/5P	CX-4832A or CX-12972	CL 6922 (4832 ICU)	N/R	None
CH-46E	A/P23P-14A(V)	HGU-84/6P	CX-13128/A (Note 3)	CX-4707C/A	N/R	None
AH-1W	A/P23P-14A(V)	HGU-67/P	CX-13165	CL 6922 (4832 ICU)	CX-4434/U	None
UH-1N	A/P23P-14A(V)	HGU-84/2P	CX-4832A or CX-12972	1505068	N/R	None
CH-53D	A/P23P-14A(V)	HGU-84/7P - pilot/copilot HGU-84/4P - crew	CX-4832A or CX-12972	CL 6922 (4832 ICU)	N/R	AM-3597C/A
CH-53E	A/P23P-14A(V)	HGU-84/1P	CX-4832A	CL 6922 (4832 ICU)	N/R	AM-3597C/A
Notes: 1. Ground communications cords are supplied within each respirator assembly transit case. If not, they must be ordered through normal supply channels. 2. Amplifiers are not provided and must be ordered through normal supply channels. Amplifiers are attached to the end of the respirator assembly microphone and are for flight use only. 3. The M22442/19-1 (CX-12972/AR) Communication Cable is an authorized alternative for the M22442/28-1 (CX-13128/A) Communication Cable						

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- b. Ensure pusher fan is ON.
- c. Ensure hood inflates.
- d. Open hood outlet valve to ensure proper operation. (Pusher fan air should vent through valve.)
- e. Pinch-off hood inlet hose with fingers. Air should not vent through the hood outlet valve. Release hose.
- f. Pinch-off mask inlet hose with fingers. Air should vent through hood outlet valve. Release hose.
- g. Switch OFF pusher fan.

- 3. Remove red servicing clip from faceplate rip-away tab and place in transit case.
- 4. Ensure pusher fan and battery are in survival vest mounting pocket.

3-100. POSTFLIGHT INSPECTION. The Postflight Inspection, consisting of a visual inspection and cleaning of the A/P23P-14A(V) respirator assembly, shall be performed by a qualified Aircrew Survival Equipmentman (PR) at Organizational Level after each flight. To perform the Postflight Inspection, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Pad, Gauze	—
As Required	Water	—
As Required	Cloth, Cotton	—
As Required	Cloth, Abrasive	—
As Required	Towelettes, SANI-COM	No. 3205 (CAGE 18195)
As Required	Bleach, Laundry	A-A-1427 NIIN 00-598-7316
As Required	Cleaning Compound, Type I	MIL-C-43616
1	Brush, Acid	NIIN 00-514-2417
1	Brush, Sable	—
As Required	Cotton Swab	—
As Required	Alcohol, Isopropyl Rubbing	TT-I-735 NIIN 00-655-8366

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Cloth, Chamois	—
1	Cable Tie, 3.6 mm	CL 6226

Support Equipment Required

Quantity	Description	Reference Number
1	Pliers, Side Cutting, 4-inch	—
1	Cable Tie Tool, Standard	MS90387-1

3-101. Visual Inspection.

3-102. Mask Assembly. Inspect mask assembly as follows:

- 1. Hood, apron and neck seal for rips, tears or other damage, and integrity of seams.



Scratches and gouges in lens area of polycarbonate faceplate compromise visual acuity and the protective qualities of the respirator, rendering it unusable and shall be cause for removal from service.

- 2. Faceplate for scratches, gouges or other damage, and security of attaching parts.



Avoid excessive stretching of neck seal when inverting the hood to inspect internal components. Damaged neck seals may not be repaired or replaced.

- 3. Orinasal mask for obvious damage and missing parts. If nose occluders have been installed, check nose bridge area for abrasion or other damage.
- 4. Anti-suffocation disconnect to ensure integrity of the brass shear screw.
- 5. Hood and mask inlet hoses for damage and security of attachment.
- 6. Reinstall red servicing clip over faceplate rip-away tab.

3-103. Lower Assembly. Inspect lower assembly as follows:

- 1. Inspect MK-2 manifold for missing screws or other damage.
- 2. Remove pusher fan and battery from survival vest mounting pocket.



Disconnecting pusher fan from battery by any method other than grasping plug may result in damage to power cord and may lead to an in-flight failure of pusher fan.

- 3. Disconnect battery from pusher fan and check for missing parts, swelling, cracking or other damage.
- 4. Remove filter canister from pusher fan and discard, except for canisters used for training purposes which may be retained and reused for other training flights.
- 5. Inspect pusher fan for rips, tears or other damage.
- 6. Remove and inspect J-manifold gasket for damage. Reinstall or replace as necessary.

3-104. Intercommunications Unit. Inspect as follows:

- 1. Ensure no cracks, dents or other mechanical damage is found on intercom unit.
- 2. Comm cord and patch cord shall have no frayed wires, corroded pins or receptacles.
- 3. Ensure battery is not leaking fluid or any other substance.
- 4. Ensure mechanical integrity of intercom unit by checking for loose knobs, loose hardwire jack connection or a broken spring clip.

3-105. Cleaning. Clean respirator assembly in accordance with paragraph 3-92.

3-106. Transit and Ready-for-Use Storage. Following cleaning, pack respirator assembly in accordance with paragraph 3-93.

NOTE

Calendar Inspection of the respirator assembly does not commence until the respiratory assembly is removed from its vacuum sealed foil bag.

3-107. SPECIAL INSPECTION. The Special Inspection shall be performed on the A/P23P-14A(V) respirator assembly by a qualified Aircrew Survival Equipmentman (PR) at 90-day intervals for CBR assemblies being used for training, and every 270 days for those assemblies placed in service for operational use. The inspection shall include Visual Inspection, battery voltage check, bench testing, and cleaning of all assemblies and their component parts where specified. Battery shall be inspected in accordance with Chapter 6. Organizational Level Maintenance (O level) shall route all assemblies and their component parts to Intermediate Level Maintenance (I level) for Visual Inspection, bench testing, and cleaning where specified.

Materials Required			
Quantity	Description	Reference Number	
As Required	Pad, Gauze	—	
As Required	Swab, Cotton	—	
As Required	Towelettes, SANI-COM	No. 3205 (CAGE 18195)	
As Required	Bleach, Laundry	A-A-1427 NIIN 00-598-7316	
As Required	Water	—	
As Required	Alcohol, Isopropyl Rubbing	TT-I-735 NIIN 00-655-8366	
As Required	Cleaning Compound, Type I	MIL-C-43616	
As Required	Cloth, Chamois	—	
As Required	Cloth, Cotton	—	
As Required	Cloth Abrasive	—	
1	Brush, Acid	NIIN 00-514-2417	
1	Brush, Sable	—	
1	Cable Tie, 3.6 mm	CL 6226	
As Required	Cable Tie	3297AS204-3	
As Required	Cable Tie	3297AS204-2	
As Required	Cable Tie	3297AS204-1	

Support Equipment Required

Quantity	Description	Reference Number
1	Cable Tie Tool, Standard	MS90387-1
1	Cable Tie Tool, Heavy Duty	NIIN 00-937-5438
1	Pincer Tool, Low Profile	Oetiker 14100055
	or	
1	Pliers, Hose Clamp	NIIN 01-073-4187
1	Pliers, side cutting, 4-inch	NIIN 00-514-2417

1. Unpack respirator assembly.
2. Visually inspect the respirator assembly in accordance with paragraph 3-86.
3. Perform bench test on respirator assembly in accordance with paragraph 3-111.
4. Clean respirator assembly in accordance with paragraph 3-92.

NOTE

Rubber products have a natural memory, and may develop permanent wrinkles or folds over a period of time when stored, wrinkled or folded.

5. Stow respirator assembly. Carefully place respirator assembly in its transit case with as few folds and wrinkles as possible. Secure with retaining straps as illustrated on transit case lid.

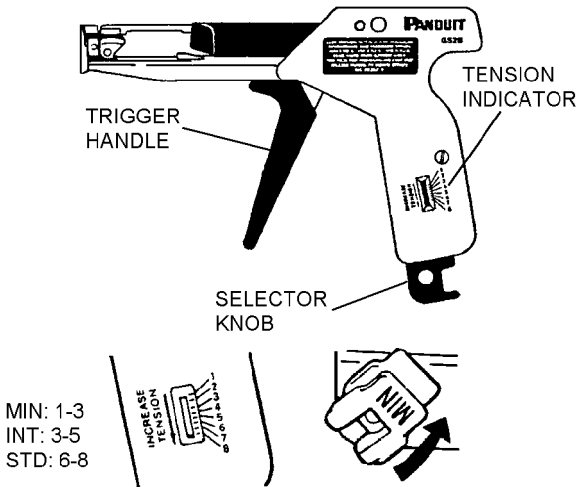
6. Document in accordance with OPNAVINST 4790.2 Series.

3-108. CABLE TIE AND STEPLESS LOW PROFILE CLAMP INSTALLATION PROCEDURES.

3-109. CABLE TIE INSTALLATION. The following cable tie installation procedures shall be used as required (refer to table 3-2).

1. Locate selector knob on bottom of cable tie tool's handle and flip knob to the correct position for cable ties being installed.

2. Adjust the tension indicator on handle of tool by turning selector knob clockwise to increase tension, or counter-clockwise to decrease tension.



SELECTOR KNOB SETTINGS

A	C	B	

MS90387-1 SHOWN

Steps 1 and 2 - Para 3-109

3p109s1

Table 3-2. Cable Tie Tool, Cable Tie and Low Profile Clamp Selection Chart

Panduit or Equivalent

P/N GS2B (STD) MS90387-1			P/N GS4H (Heavy) NIIN 00-937-5438		
Tension	Setting	lbs	Tension	Setting	lbs
MIN INT STD	1-3 3-5 6-8	4 (18 lbs) 7 (30 lbs)	STD HVY	1-4 5-8	8 (65 lbs)

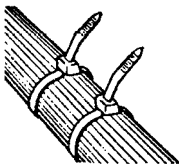
Cable Ties (with Barb)

CL P/N	Width	Application	Tension
6225	2.4 mm	Microphone, drink facility	INT (No. 4)
6226	3.6 mm	Snout, orinasal mask inhalation duct	INT (No. 4)
6227	4.8 mm	Hood inlet adapter, anti-suffocation disconnect	STD (No. 7)
6528	7.6 mm	Pusher fan	HVY (No. 8)

Low Profile Clamps

CL P/N	Dia.	Application
6592	16.5 mm	MK-2 Manifold outlet port (right)
6593	21.9 mm	MK-2 Manifold outlet port (left)
3297AS201-3	28.6 mm	MK-2 Manifold inlet port, J-Manifold

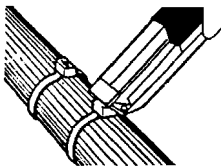
3. Loop cable tie around component to be secured, with head facing outward and insert tip through head. Pull cable tie snug by hand. Refer to [Step 4](#) for proper position of cable tie head on the component.



Step 3 - Para 3-109

3p109s3

4. Insert tail of cable tie into tool. With nose of tool flush to cable tie head, squeeze trigger handle. Tool will tighten cable tie and cut off excess.



Step 4 - Para 3-109

3p109s4

NOTE

Cable tie shall secure component snugly to mask, so that inadvertent disconnection is not possible. However, at no time shall component show signs of distortion upon installation of cable tie.

3-110. STEPLESS LOW PROFILE CLAMP INSTALLATION. The following stepless low profile clamp installation procedures shall be used as required (refer to [table 3-2](#)).

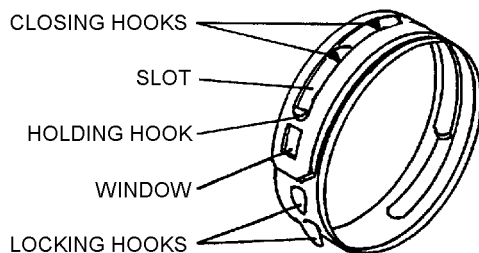
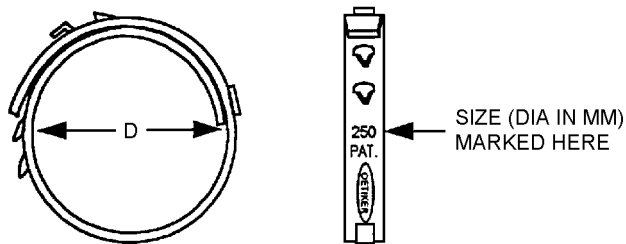
WARNING

It is critical the correct size clamp be used. Size of clamp is marked in MM just above PAT marking on the clamp.

CAUTION

Do not over expand clamp.

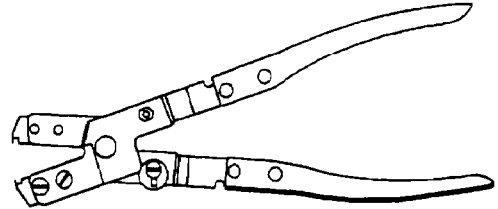
1. Place low profile clamp over end of hose or tube to be clamped. The clamp may be slightly expanded to fit over end of hose or tube.
2. Engage lock tab in slot. This is a pre-clamping position only.



Step 2 - Para 3-110

3p110s2

3. Insert pointed tips of low profile pincers into tensioning hook and tensioning tunnel.



OETIKER 14100055 OR PLIERS,
HOSE CLAMP, NIIN 01-073-4187

Step 3 - Para 3-110

3p110s3

4. Secure clamp by drawing closing hooks together. When both slot and window are directly over the hooks, press end of clamp down with thumb to engage clamp. Release tension on tool and inspect hooks for proper engagement.

5. To remove clamp, engage tips of low profile pincer in closing hooks as in [step 3](#) above. Draw hooks together and disengage windows from locking hooks.

3-111. BENCH TESTS.

3-112. The A/P23P-14A(V) Respirator Assembly shall be bench tested by a qualified Aircrew Survival Equipmentman (PR) during Place-in-Service and Special Inspections. Where specified, test results shall be recorded on the Performance Test Sheet included as [figure 3-31](#).

Materials Required

Quantity	Description	Reference Number
As Required	Leak Detection Compound	MIL-L-25567
As Required	Paper, Absorbent	—
As Required	Cable Tie, 3.6 mm	CL 6226
1	Acid Brush	NIIN 00-514-2417
1	Latex Coating SPRAYLAT A	—

NAVAIR 13-1-6.10

Support Equipment Required

Quantity	Description	Reference Number
1	Cable Tie Tool	NIIN 00-937-5438
1	External Power Supply	NIIN 00-165-3838 (or Equivalent)
1	Pliers, Side Cutting 4-inch	3297AS201-4
1	Test Set, Respirator Assembly, A/E47T-28	6200005

3-112A. The bench test will determine serviceability of the following components:

1. Pusher fan.
2. Inhalation and hood inlet valve.
3. Exhalation outlet valve.
4. Compensated exhalation valve.
5. Mask assembly.
6. Hood assembly.

NOTE

A Technical Data Indoctrination Package is available for the CBR Respirator Test Set A/E47T-28, PIN# 113914. It is available in VHS, CD, DVD or electronically on the PMA-202 Website [HTTPS://pma202.navair.navy.mil/](https://pma202.navair.navy.mil/). For further information, contact your FAILSAFE Representative or Aeromedical Safety Officer.

3-113. Bench tests shall be performed with the digital A/E47T-28 Test Set, Meggitt Avionics, Part No. 6200005 (figure 3-32). The tests shall be performed as close to normal temperature and pressure conditions (NTP) as possible (+20°C and 760mm-Hg), and all pressures are quoted as gage pressures (that pressure difference above standard atmospheric pressure).

3-114. Testing of A/E47T-28 test set shall be performed (in sequence) daily, prior to testing any part of the respirator assembly, and each time the test set is moved. Open each test set and verify all required items have been indicated (table 3-3). Refer to NAVAIR 17-15HB-21 for portable test set testing procedures.

3-115. A/P23P-14A(V) RESPIRATOR ASSEMBLY.

The following bench tests shall be performed on respirator assemblies in the sequence they appear. Where specified, test results shall be recorded on Performance Test Sheet indicated in figure 3-31. The test sheet should be reproduced locally. Before start of testing,

A/E47T-28 test set shall have been tested as required in NAVAIR 17-15HB-21.

3-116. Pusher Fan - Pressure Test. Bench test pusher fan subassembly as follows:

NOTE

Where specified, test results shall be recorded on the Performance Test Sheet.

A power supply adapter, P/N 3297AS623-1, (see figure 3-33) is recommended for use during all tests requiring a pusher fan. If power supply adapter is not available, pusher fan can be wired directly to external power supply (figure 3-34).

3-117. Pressure Test.

1. If attached, remove pusher fan from J-manifold.

NOTE

Ensure J-manifold gasket is seated in base of J-manifold.

2. Attach adapter #2 to pusher fan.
3. With the external power supply in the ON position, set output to 3.75 Vdc @ 1 amp.
4. Turn external power supply OFF.
5. If using power supply adapter, connect test leads from power supply to power supply adapter and plug pusher fan into power supply adapter.
6. If not using power supply adapter, connect test leads to pins of pusher fan plug as shown in figure 3-34. If a dc power supply is not available, connect pusher fan plug to a battery.
7. Connect free end of adapter #2 to T2.
8. Close V1 and V3.
9. Set V4 to OPEN.
10. Set V2 to 2.
11. Turn on the power supply. Allow pusher fan to stabilize for a period of 1 minute.
12. Manometer reading shall be 2.6 in H₂O or higher. Record the results on Performance Test Sheet. If reading is not 2.6 in H₂O or higher, refer to trouble shooting procedures in table 3-4.
13. Turn OFF power supply.
14. Remove adapter #2 from T2.
15. Remove adapter #2 from pusher fan.
16. Disconnect pusher fan plug.

PERFORMANCE TEST SHEET

DATE _____ MASK P/N _____

OPERATOR: _____ DIGITAL TEST SET S/N: _____

MASK S/N: _____

PUSHER FAN - PRESSURE TEST

REQUIRED READING	ACTUAL READING
2.6 IN. H ₂ O OR HIGHER	

NOTE: BEFORE PROCEEDING, THE PUSHER FAN MUST HAVE PASSED THE PRESSURE TEST.

INHALATION & HOOD INLET VALVE - REVERSE LEAKAGE TEST

REQUIRED READING	ACTUAL READING @ T = 7 SEC.
BETWEEN -2 AND -4 IN. H ₂ O	

EXHALATION OUTLET VALVE - REVERSE LEAKAGE TEST

REQUIRED READING	ACTUAL READING @ T = 12 SEC.
BETWEEN 0.5 AND 1.0 IN. H ₂ O	

COMPENSATED EXHALATION VALVE - FUNCTIONAL TEST

	REQUIRED READING	ACTUAL READING	DOES AIR VENT?
1	2.6 IN. H ₂ O OR HIGHER		
	NOT MORE THAN 1.5 IN. H ₂ O		
2	2.6 IN. H ₂ O OR HIGHER		
	NOT MORE THAN 1.5 IN. H ₂ O		
3	2.6 IN. H ₂ O OR HIGHER		
	NOT MORE THAN 1.5 IN. H ₂ O		

Figure 3-31. Performance Test Sheet (Sheet 1 of 2)

NAVAIR 13-1-6.10

MASK ASSEMBLY - OVERALL LEAKAGE TEST

REQUIRED READING	ACTUAL READING
BETWEEN 1.95 AND 2.0 IN. H ₂ O	

NOTE: THE FOLLOWING TEST IS ONLY TO BE PERFORMED AS A BACKUP TEST TO THE MASK ASSEMBLY - OVERALL LEAKAGE TEST IN HELPING TO ISOLATE A DEFICIENCY

HOOD ASSEMBLY - OVERALL LEAKAGE TEST

REQUIRED READING	ACTUAL READING
BETWEEN 1.95 AND 2.0 IN. H ₂ O	

CIRCLE ONE: PASS OR FAIL, IF FAIL, LIST REASONS BELOW:

Figure 3-31. Performance Test Sheet (Sheet 2 of 2)

Table 3-3. Portable Test Set Test Equipment

Nomenclature	Qty	Part Number
Hood Support Assembly	1	1501751
Neck Seal Test Assembly	1	6330002
Blank Male B1	1	1501792
Blank B2	1	818068
Blank B3	1	6330006
Blank B4	1	6330005
Blank B5 - Mask Inlet Adapter	1	1501242
Blank B6 - Hood Inlet	1	1501257
Blank B7 - Canister	3	1501766
Adapter E	1	1501803
Adapter G	1	6330003
Adapter H	1	6330004
Adapter J	1	1501853
Adapter K	1	6330008
Adapter M	1	8005097
Adapter No. 2	1	6089050
O-rings, Spares	Assorted	—

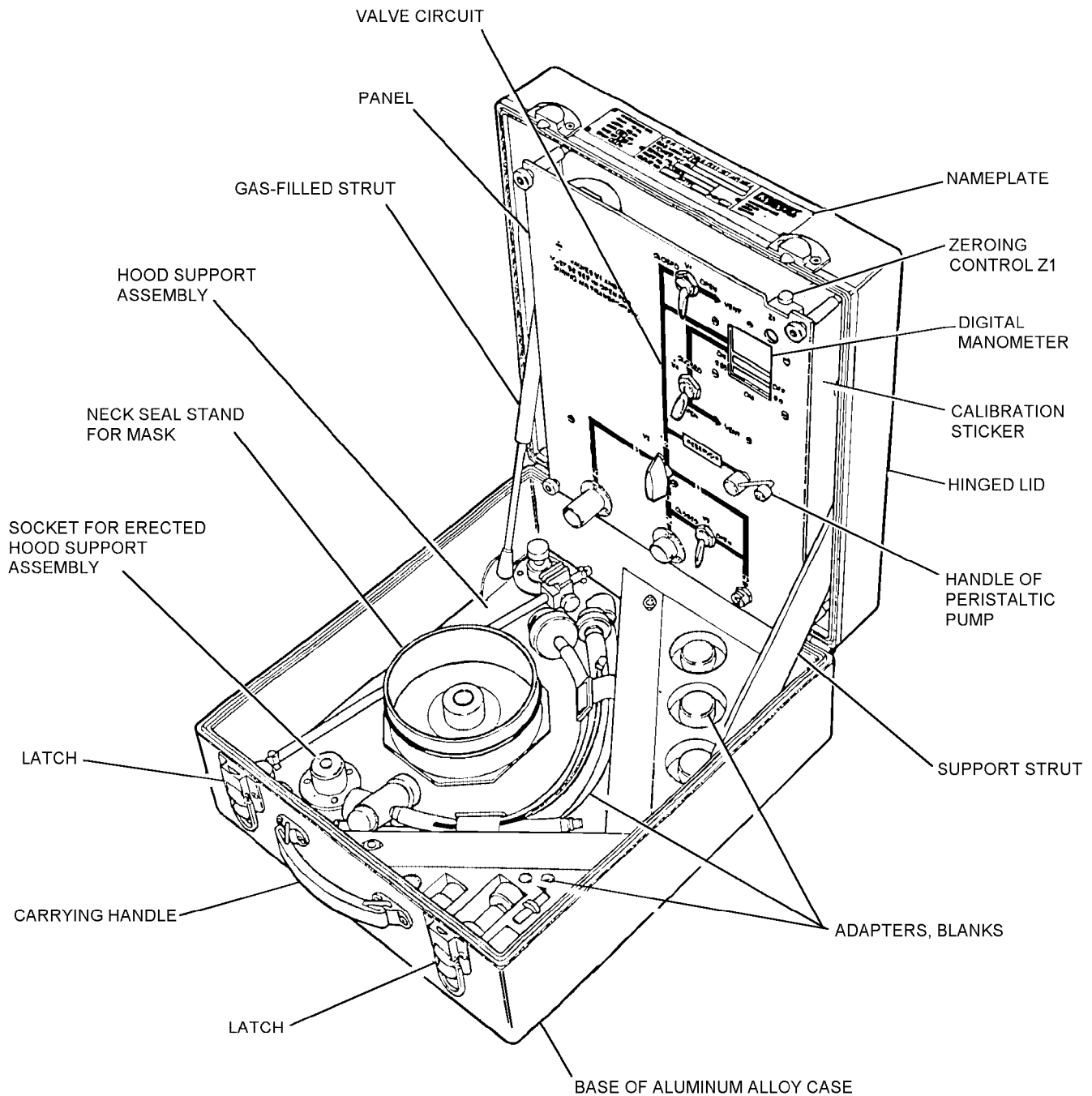
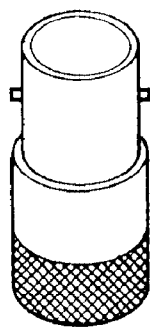
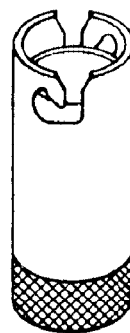


Figure 3-32. Respirator Assembly Test Set Components - A/E47T-28 (Sheet 1 of 3)

3-32-1



BLANK B1



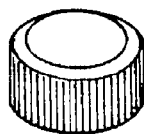
BLANK B2



BLANK B3



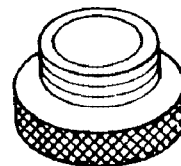
BLANK B4



BLANK B5



BLANK B6



BLANK B7

BLANKS NOT DRAWN TO SCALE

Figure 3-32. Respirator Assembly Test Set Components - A/E47T-28 (Sheet 2 of 3)

3-32-2

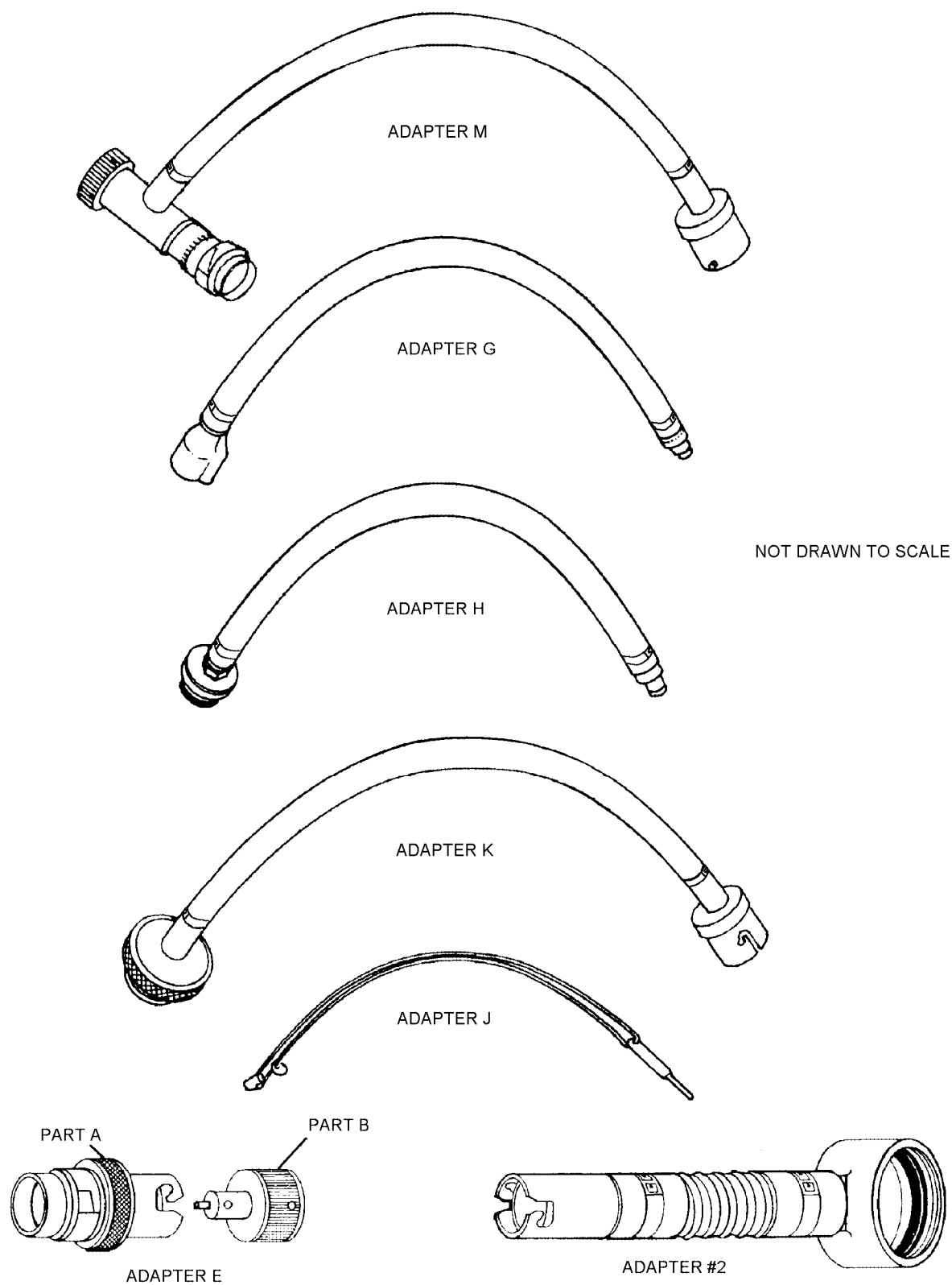


Figure 3-32. Respirator Assembly Test Set Components - A/E47T-28 (Sheet 3 of 3)

3-32-3

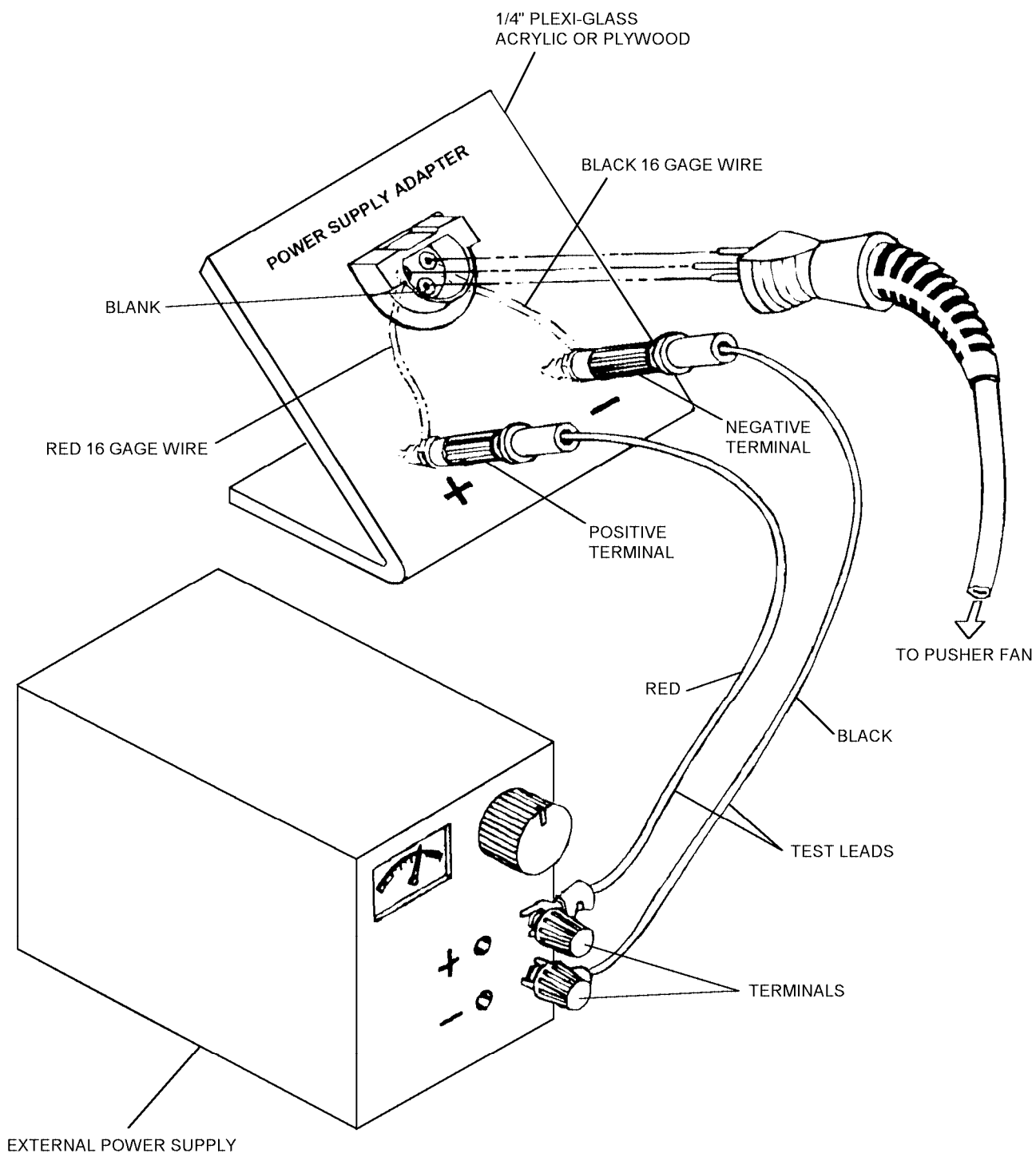


Figure 3-33. Power Supply Adapter (P/N 3297AS623-1) Pusher Fan Pressure Test

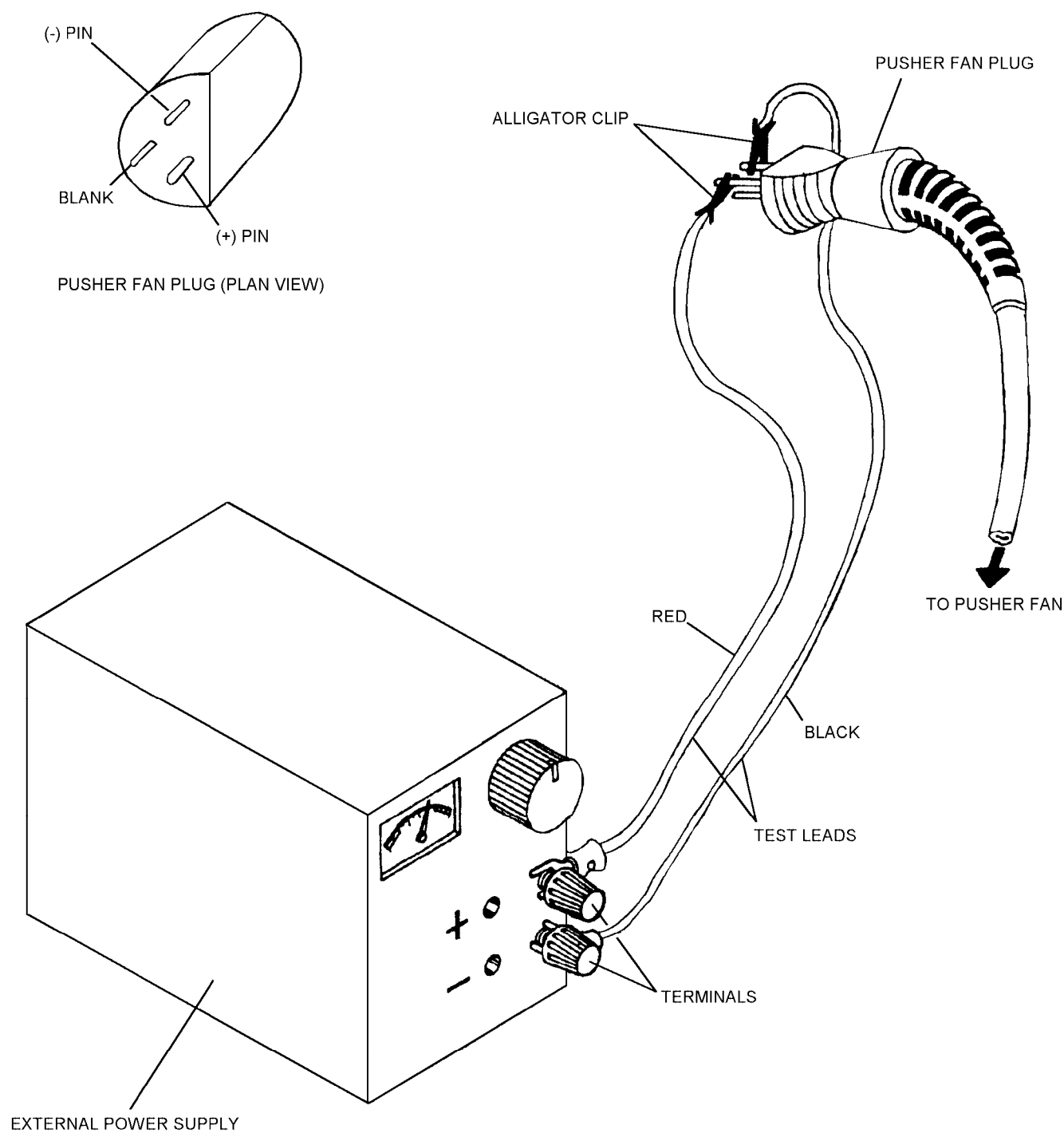


Figure 3-34. Pusher Fan Pressure Test Direct Wiring

3-118. Faceplate Visual Area - Protective Coating.

Apply a latex coating to the outside visual area of the faceplate. This will help protect the faceplate from damage during testing. Where time does not allow the use of SPRAYLAT latex coating, the velveteen cover shall be fitted to protect the optical area during testing.

1. Apply an even coat of latex coating to the outer visual area of the faceplate using a 1-inch brush.

2. Allow the coating to dry several hours, or overnight if possible. The coating turns from white to clear and becomes tough as it dries.

3-119. Inhalation and Hood Inlet Valve - Reverse Leakage Test. Bench Test mask as follows:**NOTE**

Digital test set and pusher fan shall have successfully passed their required tests (paragraphs 3-114 and 3-116, respectively) prior to performing the following tests.

The following tests shall be performed in the order they appear.

Ensure red servicing clip is installed on ripaway tab to prevent inadvertent actuation during bench testing.

Materials Required

Quantity	Description	Reference Number
As Required	Leak Detection Compound	MIL-L-25567
As Required	Paper, Absorbent	—
As Required	Latex Coating SPRAYLAT A	—
1	Brush, 1 inch	NIIN 00-260-1306
1	Cable tie, 3.6 mm	CL 6226

Support Equipment Required

Quantity	Description	Reference Number
1	Cable Tie Tool	NIIN 00-937-5438
1	Digital Multimeter	—
1	Pliers, Side cutting, 4-inch	—
1	Screwdriver, #1 Phillips	—

1. Remove pusher fan from J-manifold.
2. Support mask toggle harness on hood support clamp (figure 3-35).
3. Remove and retain brass shear screw from anti-suffocation disconnect.
4. Disconnect anti-suffocation disconnect from mask inlet adapter.
5. Connect adapter M between mask inlet adapter and anti-suffocation disconnect (figure 3-36).
6. Connect free end of adapter M to T1 (figure 3-37).
7. Fit blank B7 to J-manifold.
8. Set V1 and V3 to CLOSED.
9. Set V2 to 3.
10. Ensure V4 is OPEN.

WARNING

Overpressurization will collapse stepped rubber valve into valve seat.

11. Rotate pump handle (P1) counter-clockwise until digital manometer reads -4 in. H₂O. Once digital manometer reads -4 in. H₂O, observe and note suction reading on digital manometer during a period of 7 seconds. Do not allow pressure to exceed -4.25 in. H₂O. Reading shall be between -2 and -4 in. H₂O. Record results on Performance Test Sheet. If reading is not between -2 and -4 in. H₂O after 7 sec, refer to troubleshooting procedures in table 3-4.

12. Set V1 to OPEN.
13. Remove adapter M from T1.
14. Remove adapter M from the anti-suffocation disconnect and mask inlet adapter.

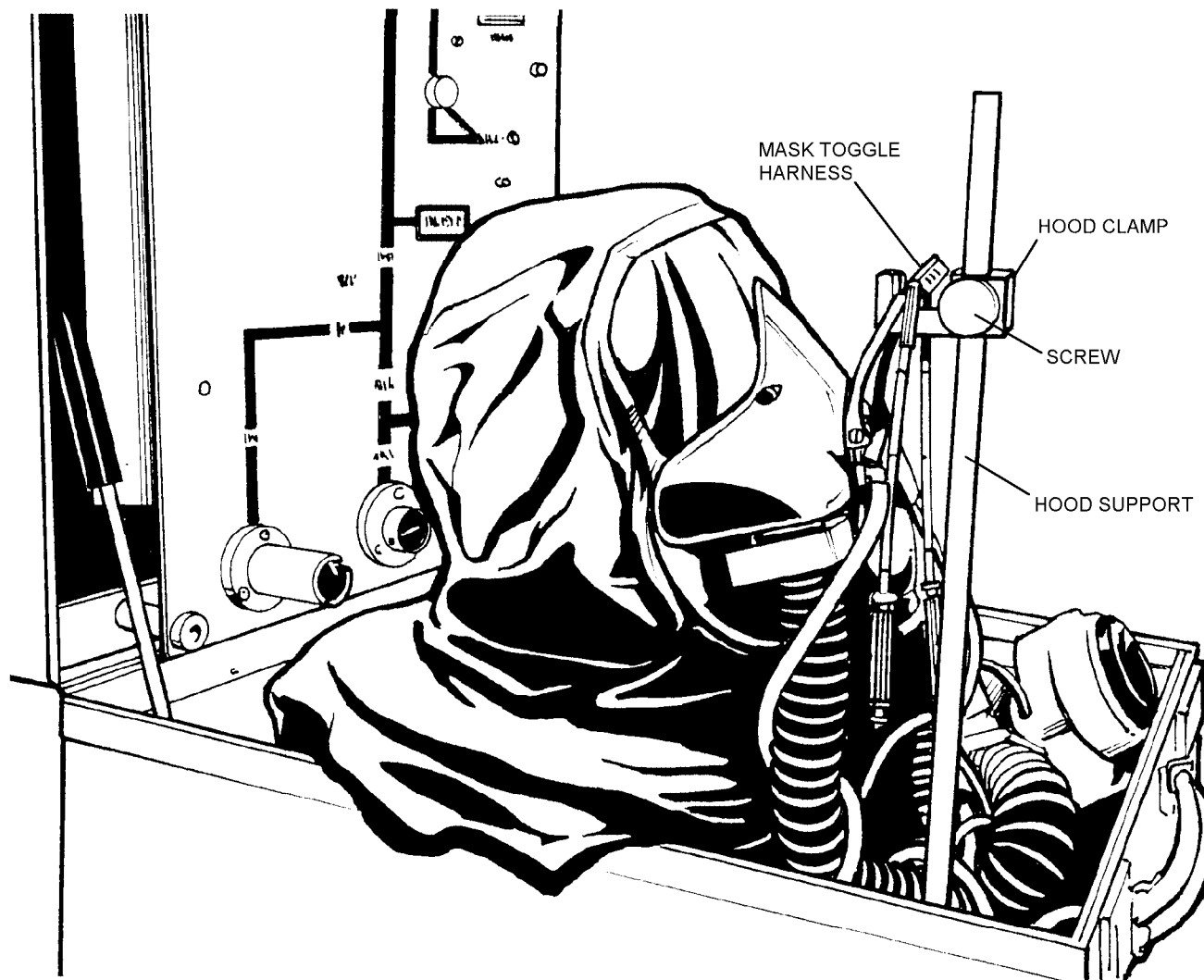


Figure 3-35. Hood Support Clamp

3-35

15. Remove blank B7 from J-manifold.

3-120. Exhalation Outlet Valve - Reverse Leakage Test.

1. Remove and discard cable tie from rubber snout.
2. Remove snout.
3. Invert hood and prop open compensated exhalation valve (inside orinasal mask) using adapter J ([figure 3-38](#)).

NOTE

Wetting the O-ring on adapter H, with water, will make it easier to fit exhalation valve port. Ensure O-ring does not roll out of its seat.

4. Slowly push adapter H into the exhalation valve port. Push straight in until O-ring is no longer visible ([figure 3-39](#)).
5. Connect free end of adapter H to T3 ([figure 3-40](#)).
6. Set V1 to CLOSED.
7. Set V2 to 1.

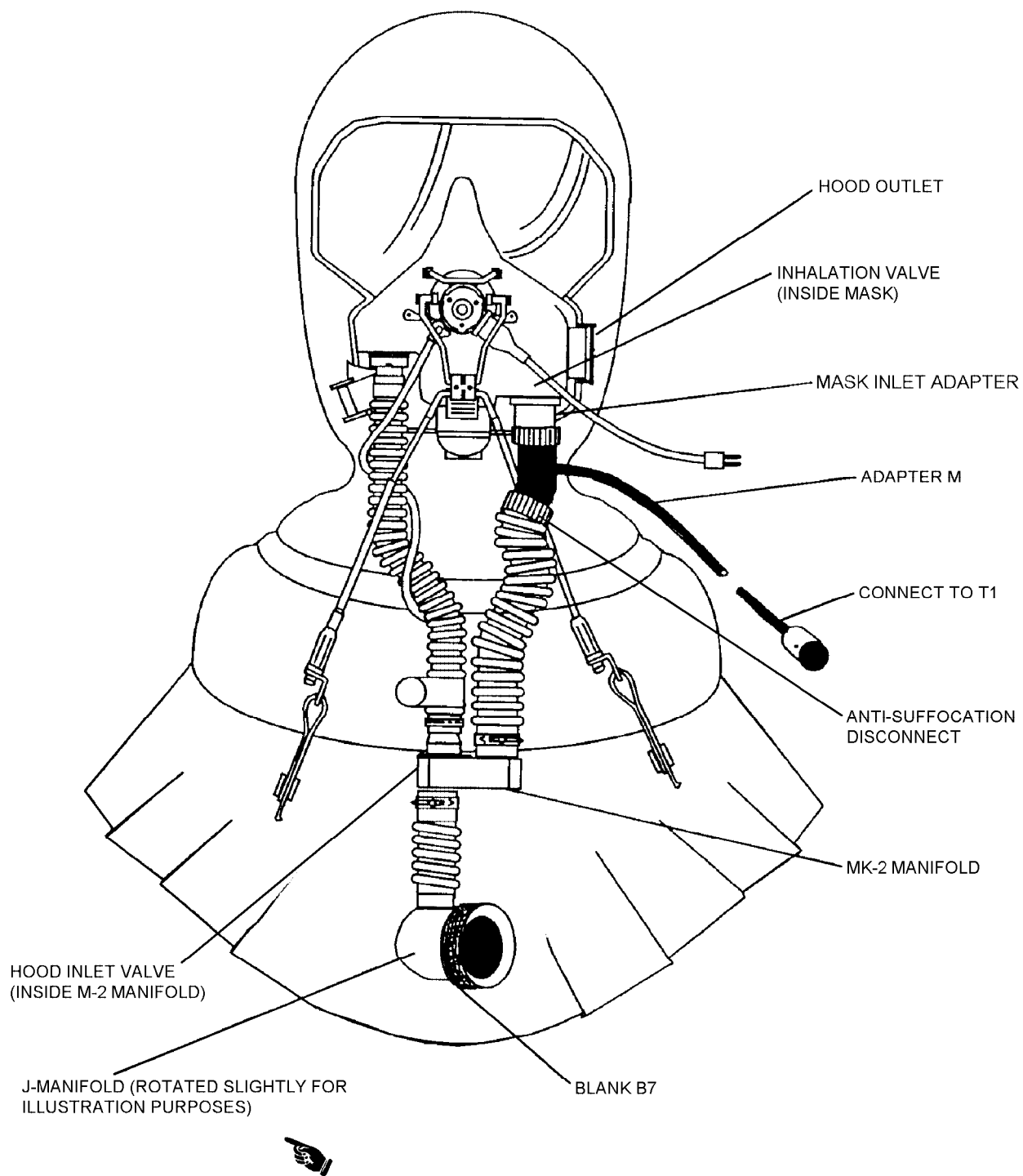
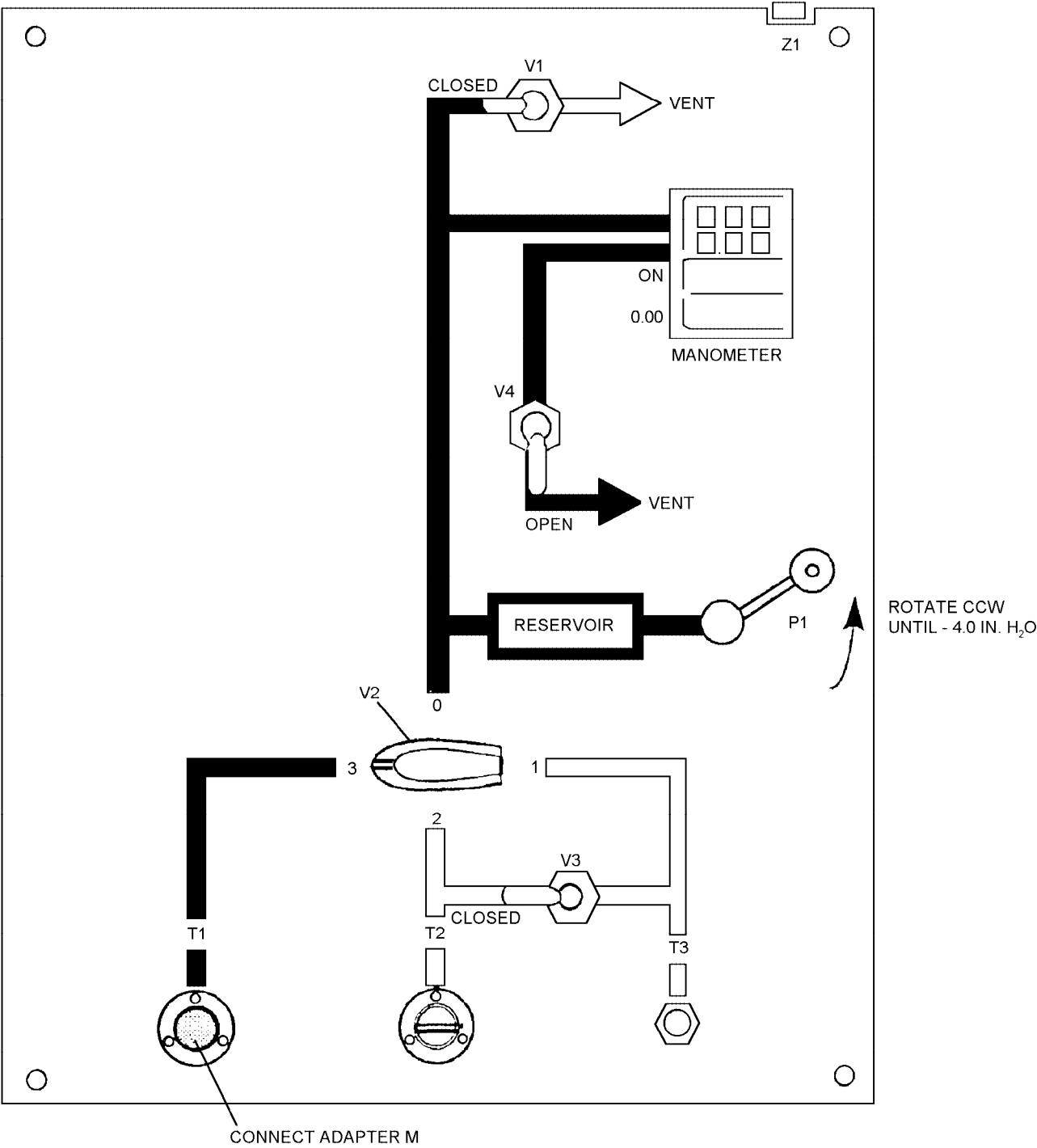


Figure 3-36. Inhalation and Hood Inlet Valves - Reverse Leakage Test

3-36



3-37

Figure 3-37. Test Panel Configuration - Inhalation and Hood Inlet Valves - Reverse Leakage Test

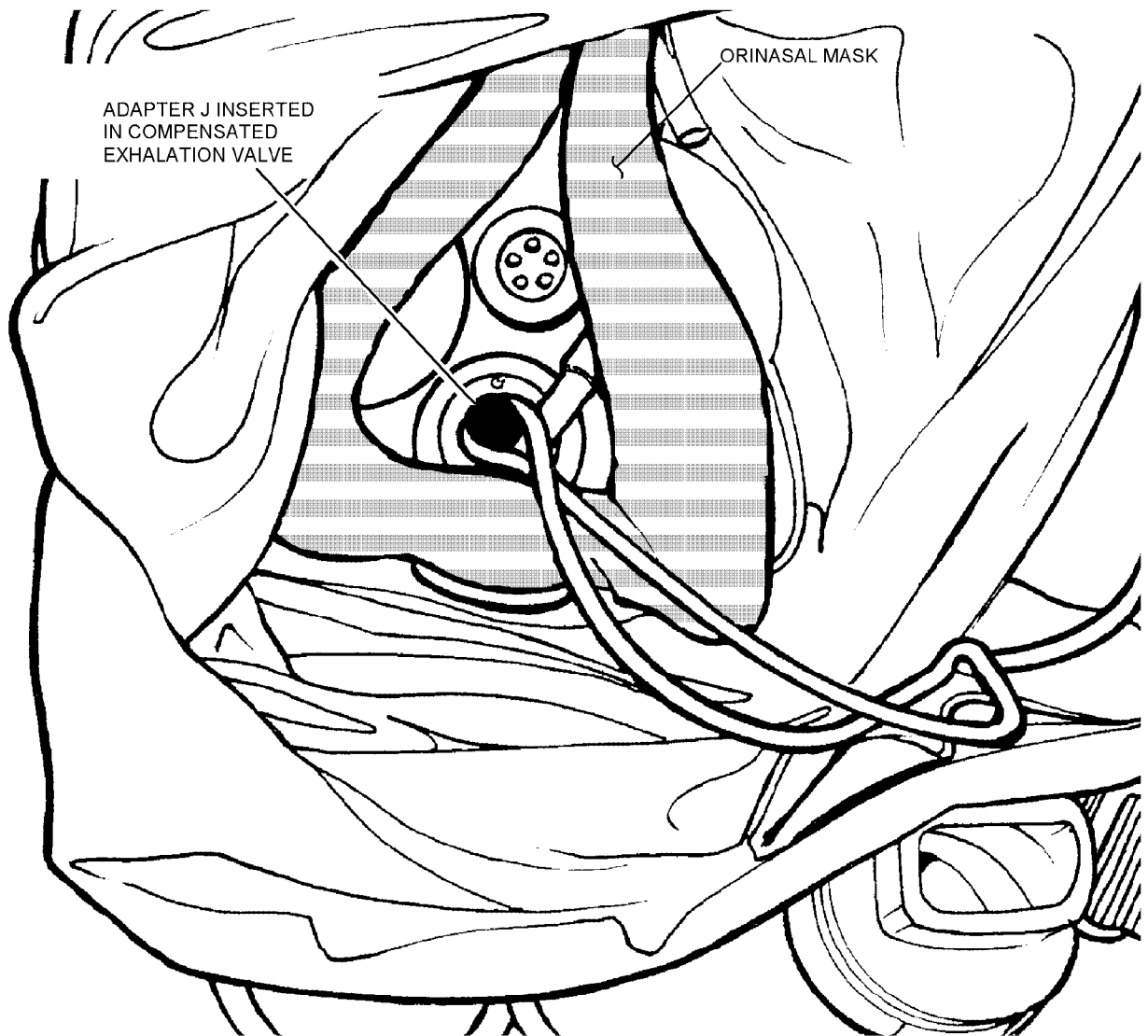


Figure 3-38. Inverted Hood

3-38

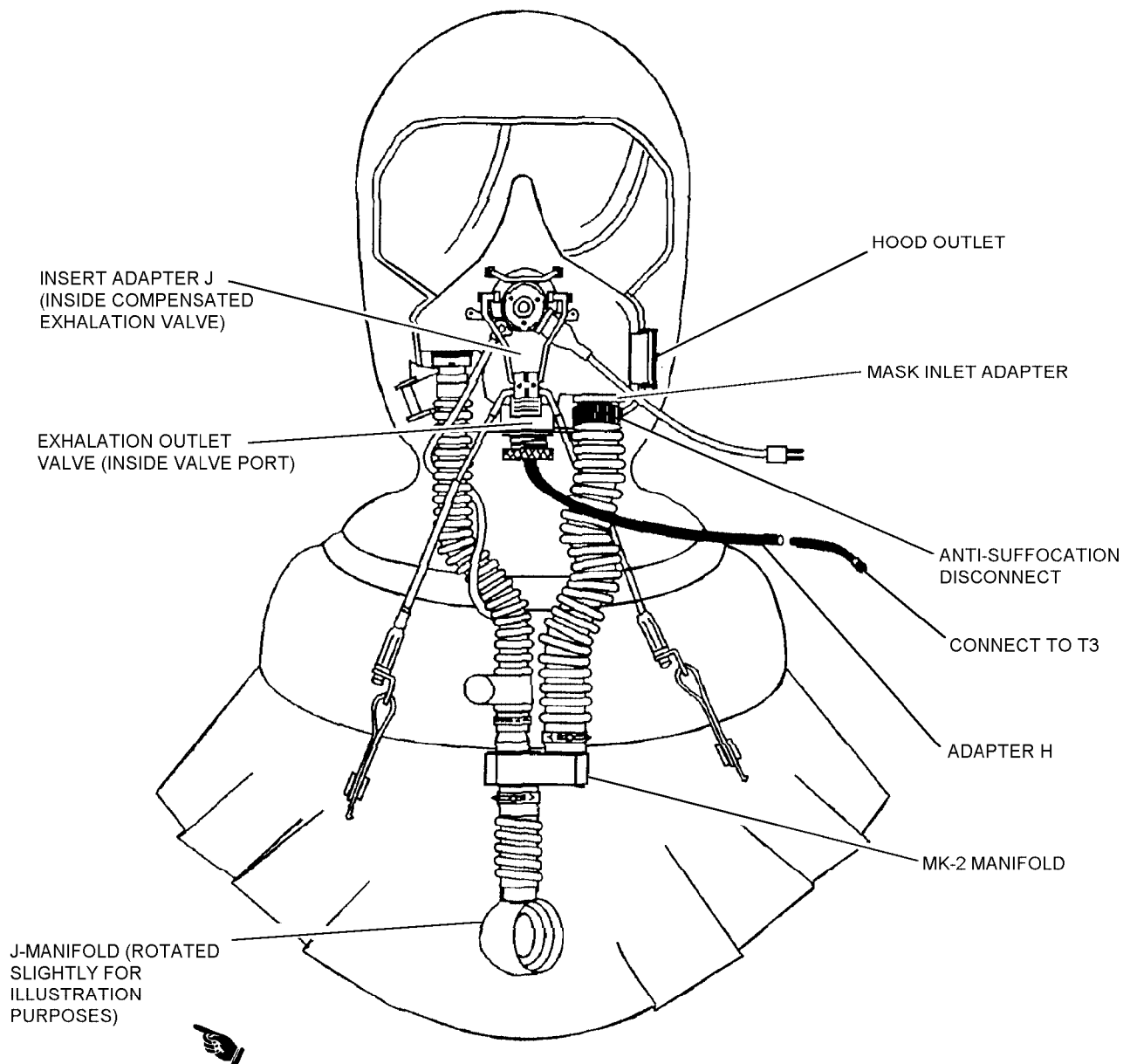


Figure 3-39. Exhalation Outlet Valve - Reverse Leakage Test

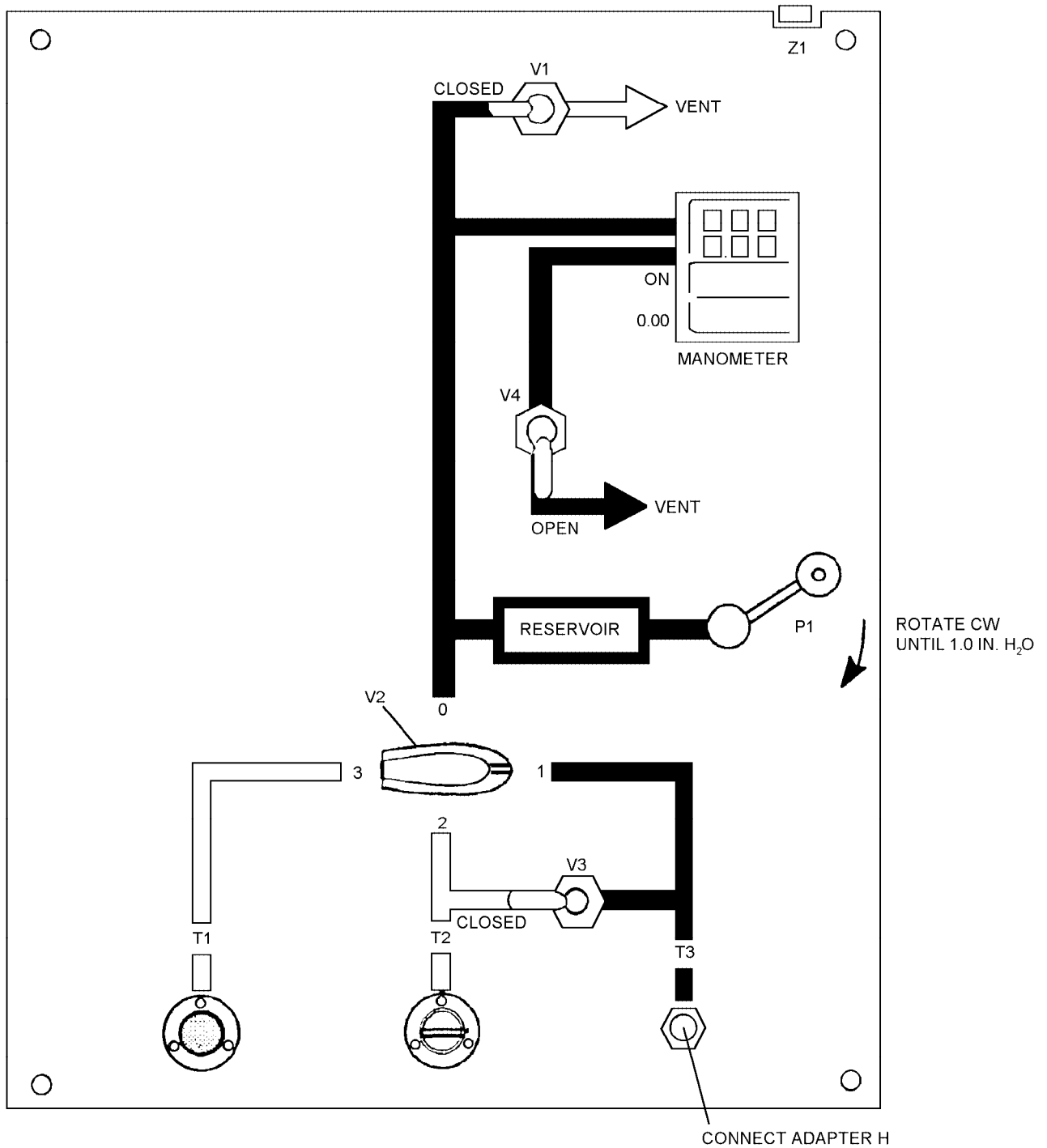


Figure 3-40. Test Panel Configuration Exhalation Outlet Valve - Reverse Leakage Test

3-40

8. Set V3 to CLOSED.

9. Set V4 to OPEN.

10. Very slowly, rotate pump handle (P1) clockwise until digital manometer reads 1 in. H₂O. Once digital manometer reaches 1 in. H₂O observe and note the pressure reading during a 12 second period. The digital manometer reading shall be between 0.5 and 1.0 in. H₂O. Record the results on Performance Test Sheet. If the reading is not between 0.5 and 1.0 in. H₂O after 12 seconds, refer to troubleshooting procedures in [table 3-4](#).

11. Set V1 to OPEN.

12. Remove adapter H from T3 and exhalation valve port.

13. Remove adapter J from the compensated exhalation valve.

3-121. Compensated Exhalation Valve - Function Test.

1. Ensure brass shear screw is removed from anti-suffocation disconnect.

2. Separate anti-suffocation disconnect from mask inlet adapter.

3. Connect adapter E between anti-suffocation disconnect and mask inlet adapter ([figure 3-41](#)).

4. Connect adapter G to T3 and neck seal test stand ([figure 3-42](#)).

WARNING

Be careful not to rip the neck seal when fitting to neck seal test stand.

5. Fit respirator neck seal to neck seal test stand and secure with O-ring ([figure 3-43](#)).

6. Close the hood outlet valve.

7. Fit pusher fan to J-manifold (if not already connected).

8. Connect power supply to pusher fan (as performed during pusher fan pressure test).

NOTE

If a dc power supply is not available, a fully charged NiCad battery (P/N 3297AS601-1) or a lithium manganese dioxide battery (P/N 3297AS601-2) may be used.

9. Set V1 to CLOSED.

10. Set V2 to 1.

11. Ensure V3 is CLOSED.

12. Ensure V4 is OPEN.

13. Turn power supply on and note pressure on digital manometer after hood is fully inflated. Ensure external power supply is providing an output of 3.75 Vdc at 1 amp. Allow to stabilize for a period of 1 minute before taking a reading. Digital manometer shall read 2.6 in. H₂O or higher. Record result on Performance Test Sheet. If manometer does not read 2.6 in. H₂O or higher, refer to troubleshooting procedures in [table 3-4](#).

14. Disconnect adapter E (quick disconnect) into two halves. Ensure air vents from mask exhalation valve port.

15. Observe and note pressure shall not be more than 1.5 in. H₂O. Record result on the Performance Test Sheet. If pressure is more than 1.5 in. H₂O, refer to troubleshooting procedures in [table 3-4](#).

16. Re-connect adapter E (quick disconnect).

17. Repeat the test procedure from [steps 14-16](#) three times.

18. Turn OFF power supply.

19. Open hood outlet valve.

20. Disconnect pusher fan from power supply.

21. Remove adapter E from mask inlet adapter and anti-suffocation disconnect.

22. Reconnect mask inlet adapter and anti-suffocation disconnect.

23. Reassemble adapter E.

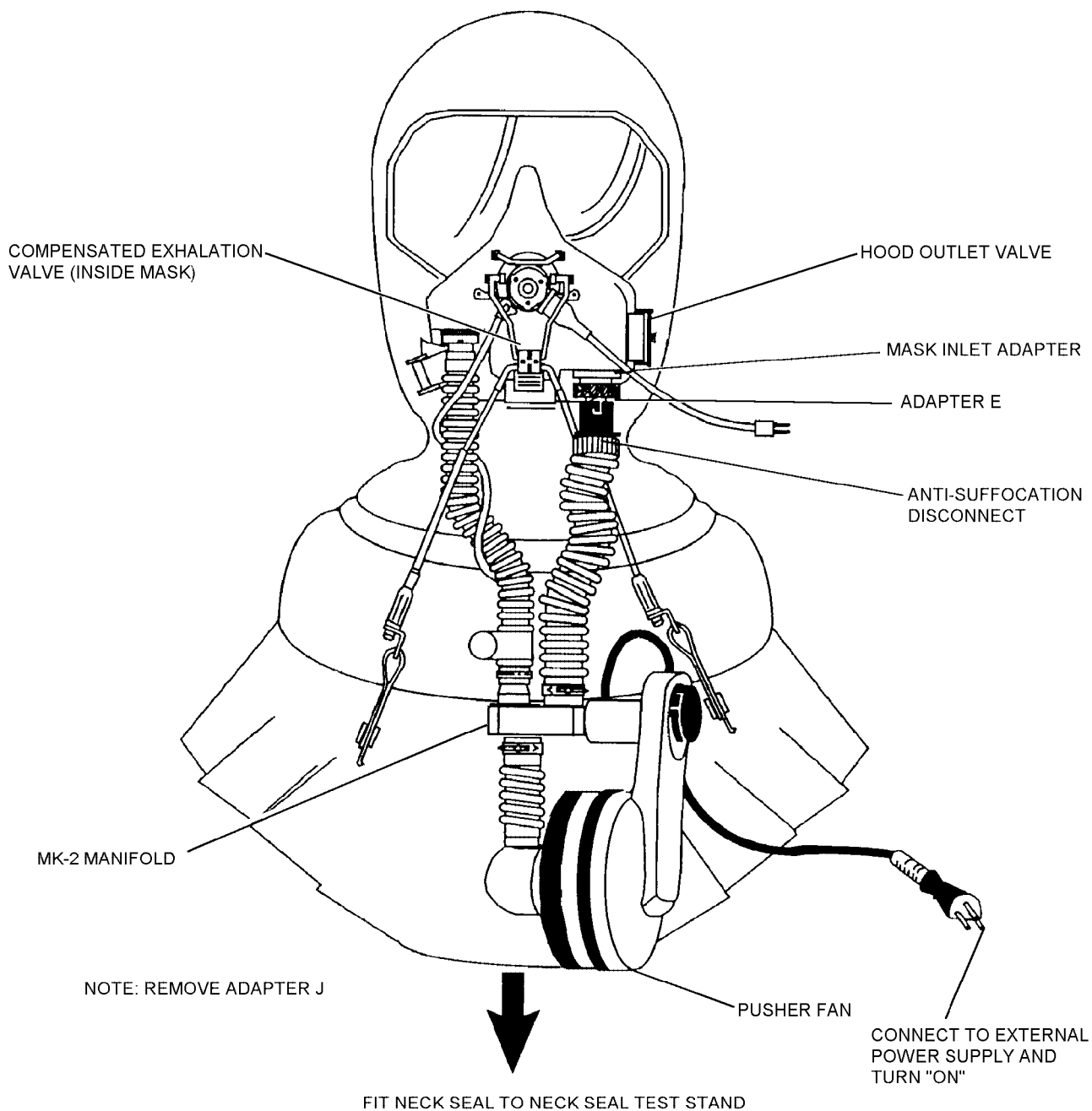
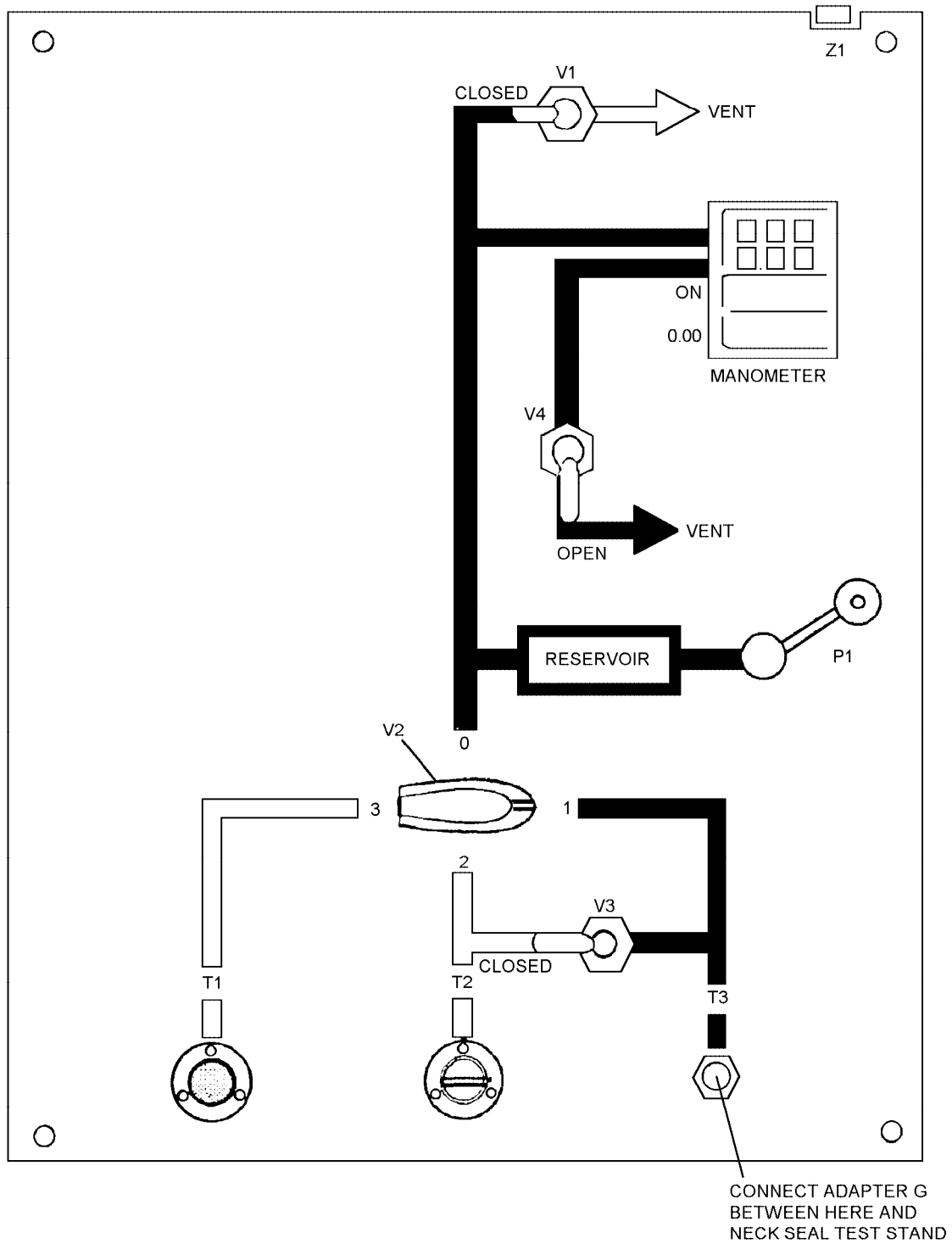


Figure 3-41. Compensated Exhalation Valve - Functional Test



3-42

Figure 3-42. Test Panel Configuration - Compensated Exhalation Valve - Functional Test

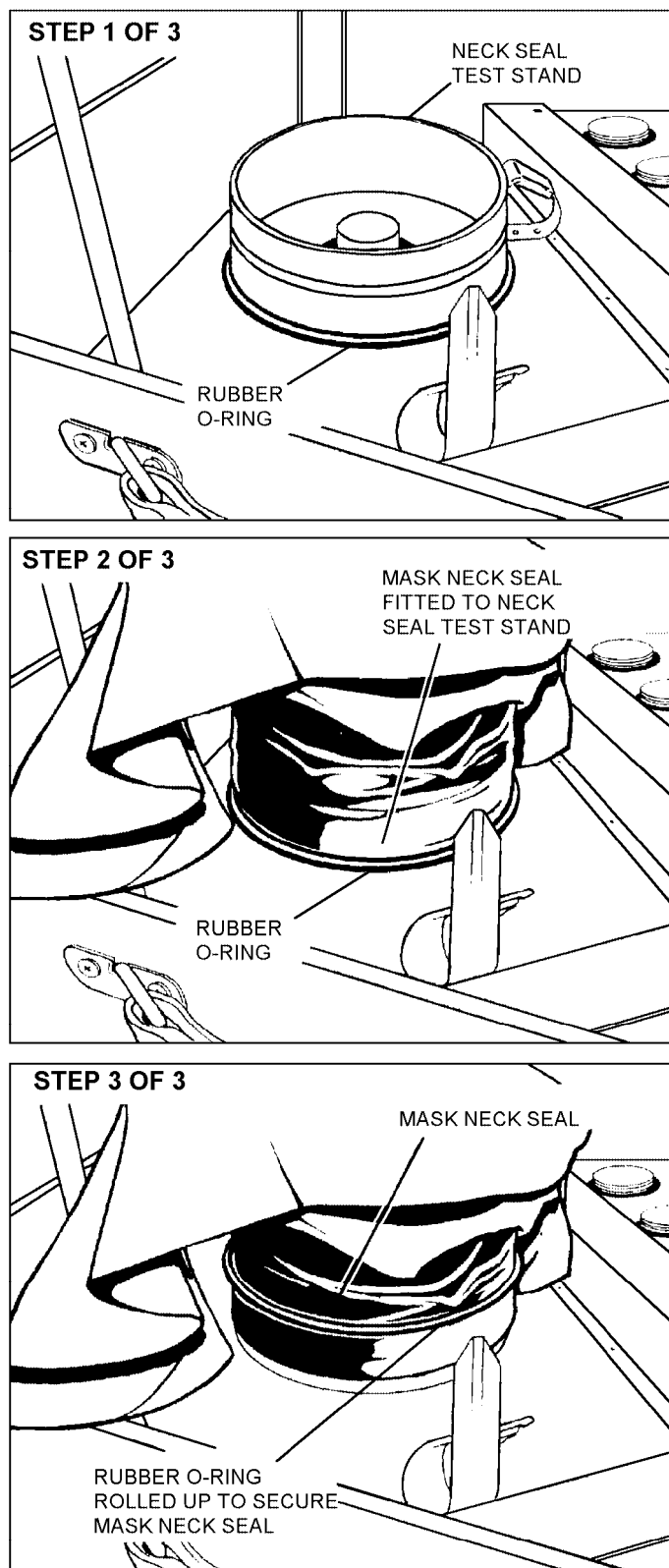


Figure 3-43. Neck Seal Test Stand

3-122. Mask Assembly - Overall Leakage Test.

1. Ensure neck seal is properly fitted to neck seal test stand (figure 3-43).
2. Fit blank B7 to J-manifold (figure 3-44).
3. Ensure adapter G is correctly fitted between T3 and neck seal test stand port (figure 3-45).
4. Close hood outlet valve.

NOTE

Wetting O-ring on adapter H, with water, will make it easier to fit the exhalation valve port. Ensure O-ring does not roll out of its seat.

5. Slowly push adapter H into the exhalation valve port. Push straight-in until O-ring is no longer visible.
6. Fit blank B4 to free end of adapter H.
7. Screw pusher fan into test adapter #2.
8. Connect free end of test adapter #2 to T2.
9. Set V1 to CLOSED.
10. Set V2 to 1.
11. Set V3 and V4 to OPEN.
12. Connect pusher fan to power supply. Ensure power supply output is on and set to 3.75 Vdc at 1 amp.
13. Inflate hood until 2 in. H₂O is indicated on digital manometer, then set V3 to CLOSED.
14. Allow system to stabilize for a period of one minute. Switch V3 from CLOSED to OPEN to maintain 2 in. H₂O.
15. Set V3 to CLOSED and turn off power supply to pusher fan.
16. Observe and note pressure on digital manometer is between 2.0 and 1.95 in. H₂O after one min-

ute. It may be necessary to exceed 2 in. H₂O and repeat several times until pressure stabilizes. Record the result on Performance Test Sheet. If manometer does not read between 1.95 and 2.0 in. H₂O, refer to troubleshooting procedures in table 3-4.

17. Open hood outlet valve.
18. Set V1 to OPEN.
19. Disconnect pusher fan from external power supply.
20. Disconnect adapter #2 from T2.
21. Remove adapter #2 from pusher fan.
22. Remove respirator from neck seal test stand.
23. Remove adapter G from T3 and neck seal test stand.
24. Remove adapter H and blank B4.
25. Refit snout and secure with a 3.6mm wide, black cable tie. Tension with a cable tie tool set to STD setting. Position cable tie head close to mask.
26. Remove blank B7 from J-manifold.
27. Refit pusher fan assembly to J-manifold.
28. Refit shear screw to anti-suffocation disconnect.
29. Complete Performance Test Sheet.

NOTE

The following test should only be performed to help isolate a leak in the mask.

3-123. Hood Assembly - Overall Leakage Test

1. Remove shear screw and retain. Detach hood and orinasal mask hoses from mask in accordance with disassembly procedures.
2. Remove cable tie securing snout to faceplate. Remove snout.

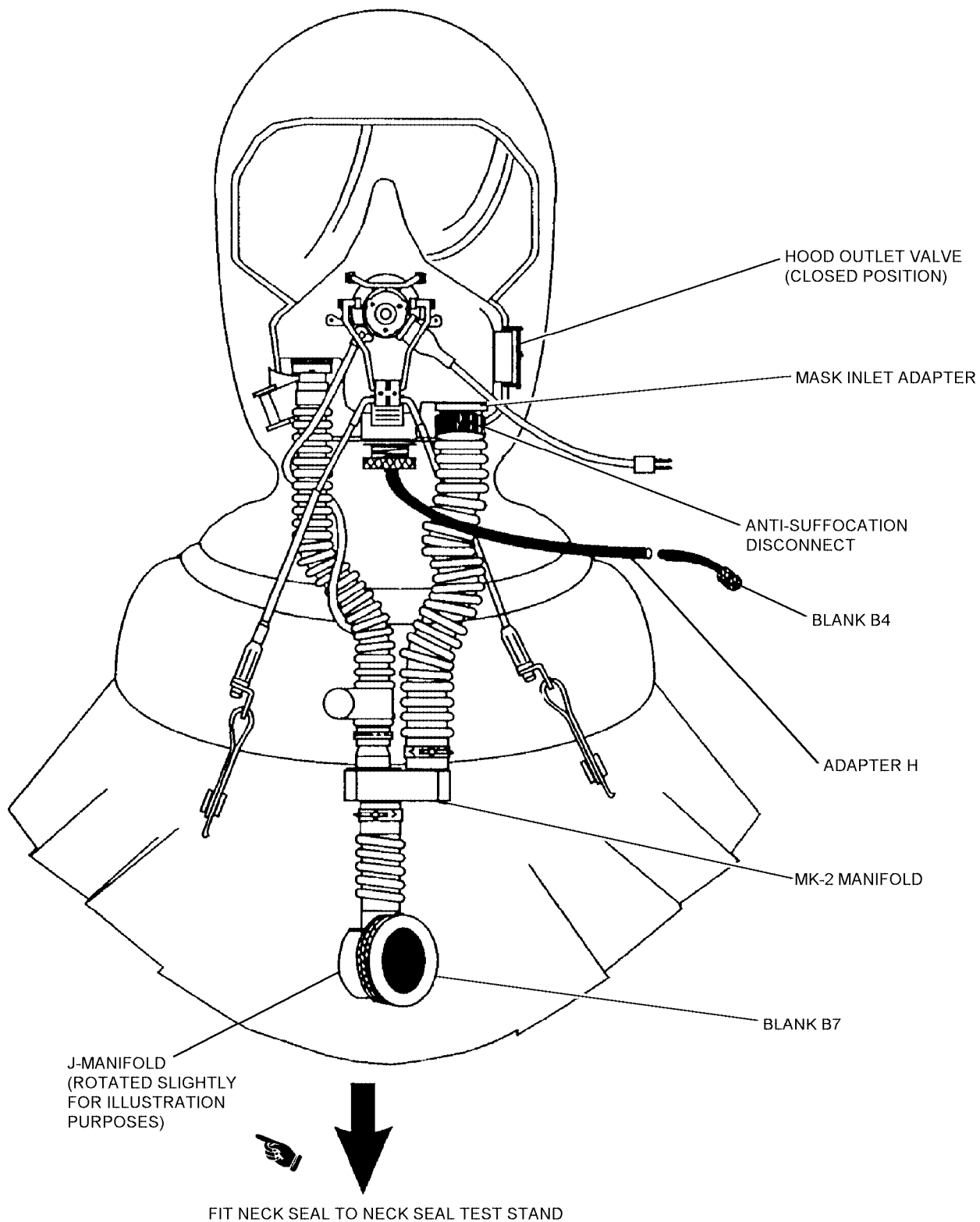


Figure 3-44. Mask Assembly - Overall Leakage Test

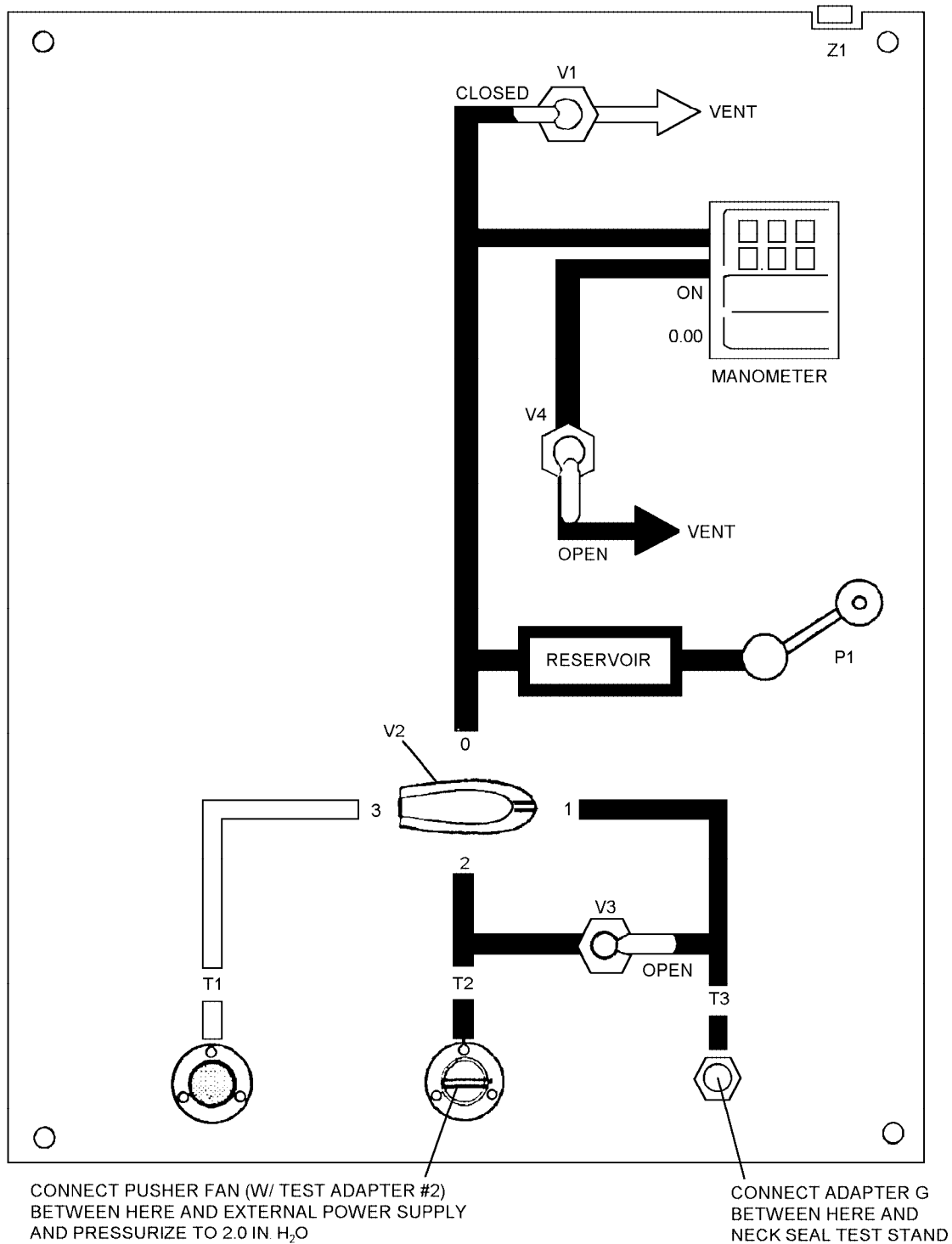


Figure 3-45. Test Panel Configuration - Mask Assembly - Overall Leakage Test

3-45

3. Connect adapter H to mask exhalation outlet valve port.
4. Fit blank B4 to free end of adapter H.
5. Support mask on hanger by its toggle harness.
6. Fit hood assembly to neck seal test stand and adjust neck seal to lie without creasing the sealing ring.
7. Close hood outlet valve.
8. Connect one end of adapter G to T3 and other end to neck seal test stand port.
9. Fit blank B5 to the mask inlet adapter ([figure 3-46](#)).
10. Fit blank B6 to hood inlet adapter ([figure 3-46](#)).
11. Remove pusher fan from the J-manifold.
12. Screw pusher fan canister into J-manifold of test adapter #2.
13. Connect test adapter #2 to T2 ([figure 3-47](#)).
14. Connect power supply to pusher fan and turn on. Ensure power supply is set to 3.75 Vdc at 1 amp.
15. Set V2 to 1 and V3 to OPEN position. Inflate hood until 2 in. H₂O is indicated on digital manometer.
16. Set V1 to CLOSED position. Set V4 to OPEN. Allow pressure within hood to stabilize, if necessary, by adjusting V1 (opening and closing) to maintain 2 in. H₂O.
17. When stabilized, set V1 to CLOSED. In the event reading is too high, reduce pressure by opening the hood outlet valve. Set power supply switch to off.
18. Observe pressure indicated on digital manometer. The pressure shall be between 1.95 and 2.0 in. H₂O during a one minute period. If manometer fails to indicate or if pressure is not between 1.95 and 2.0 in. H₂O, refer to troubleshooting procedures in [table 3-4](#). Record results on Performance Test Sheet.
19. Set V1 to OPEN.
20. Open the hood outlet valve.
21. Disconnect test adapter #2 from T2 and disconnect from external power supply.
22. Remove pusher fan from test adapter #2.
23. Replace pusher fan to J-manifold.
24. Remove adapter G.
25. Remove blanks B4, B5, and B6.
26. Remove mask from neck seal stand and support hanger. Fit velveteen cover.
27. Remove adapter H from the exhalation valve port.
28. Refit snout hood and orinasal mask hoses (refer to assembly section).
29. Peel away protective coating (if applied) to faceplate area prior to bench testing. Ensure no traces remain on visual area.

3-124. RESPIRATOR ASSEMBLY TROUBLESHOOTING.

- 3-125. Refer to Respirator Assembly - Troubleshooting, [table 3-4](#), for troubleshooting procedures.

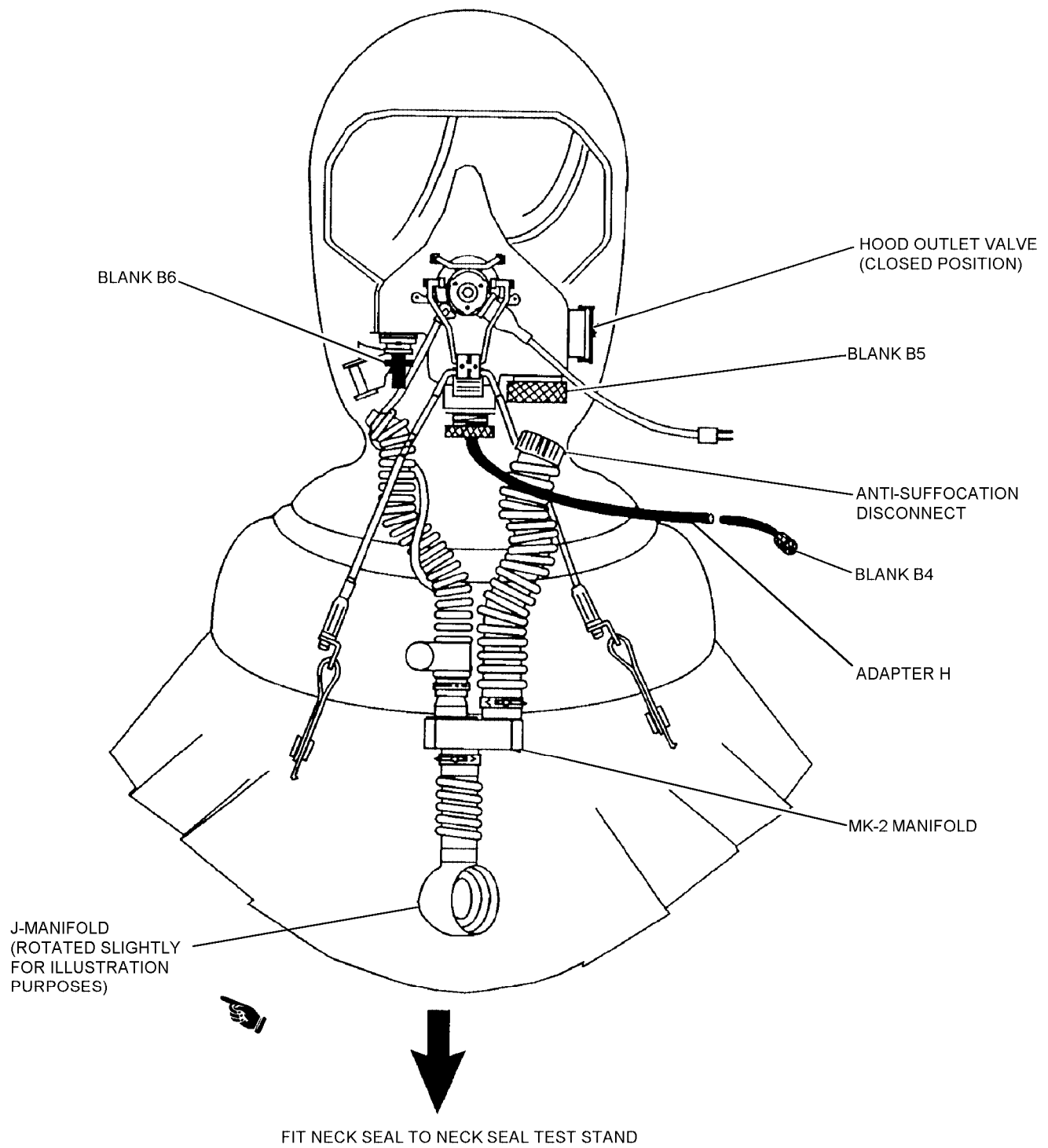


Figure 3-46. Hood Assembly - Overall Leakage Test

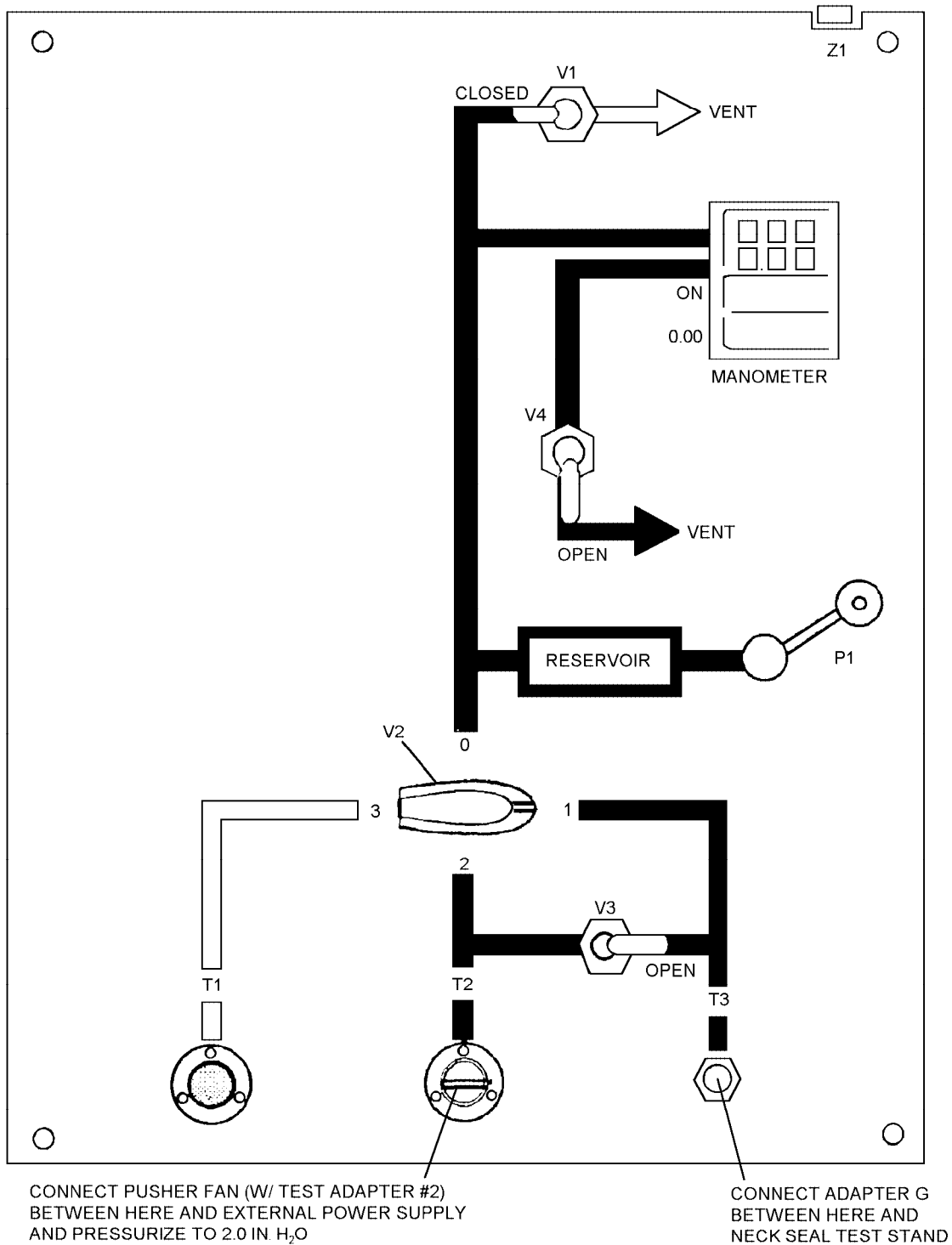


Figure 3-47. Test Panel Configuration - Hood Assembly - Overall Leakage Test

3-47

Table 3-4. Respirator Assembly - Troubleshooting

Trouble	Probable Cause	Remedy
PUSHER FAN - PRESSURE TEST		
Digital manometer does not read at least 2.6 in. H ₂ O or nothing happens.	Incorrect output setting on power supply or incorrect wiring.	Adjust power setting to 3.75V @ 1 amp. and check wiring.
	Used lithium battery. Check usage and/or shelf life.	Replace with new battery.
	Adapter #2 leaking or loose connections on test set.	Check for leakage.
	Bad pusher fan motor.	Replace w/new pusher fan.
INHALATION AND HOOD INLET VALVE - REVERSE LEAKAGE TEST		
Digital manometer does not read between -2 and -4 in. H ₂ O after 7 sec.	Leakage through hood inlet valve.	Disconnect adapter M from mask inlet adapter only. Separate adapter E into two halves. Insert part A half into the open end of adapter M. Retest. If it passes, suspect inhalation valve. If it fails, disassemble hood inlet valve and inspect the stepped rubber valve. Clean or replace and retest.
	Leakage through inhalation valve.	Disconnect anti-suffocation disconnect from Adapter M. Insert blank B5 into open end of adapter M. Retest. If it passes, suspect hood inlet valve. If it fails, remove iceguard and examine stepped rubber valve. Clean or replace and retest.
	Leakage through adapter M, test connections or incorrect valve settings.	Check, repair or replace.
EXHALATION OUTLET VALVE - REVERSE LEAKAGE TEST		
Digital manometer does not read between 0.5 and 1.0 in. H ₂ O after 12 sec.	Dirty or leaky valve.	Remove stepped rubber valve from valve seat. Clean seat and valve, and retest. If it fails, replace and retest.
	Loose connection or incorrect valve settings.	Check all connections for secure attachment. Check valve settings.
NOTE: If a respirator assembly part or component requires repair, replacement or disassembly, refer to the appropriate section.		

Table 3-4. Respirator Assembly - Troubleshooting (Cont)

Trouble	Probable Cause	Remedy
COMPENSATED EXHALATION VALVE		
Digital manometer does not read at least 2.6 in. H ₂ O.	Hood outlet valve open.	Select hood outlet valve to CLOSE position.
	Compensated exhalation valve faulty.	Examine valve plate for correct operation by gently depressing plate against spring tension several times to exercise valve. Replace valve if suspect. Make sure J-prop has not been left in valve from previous test.
	Neck seal not correctly seated on neck seal test stand.	Seat correctly.
	Pusher fan faulty or power supply not set to correct settings. Dead or low battery.	Ensure power supply is set at 3.75V @ 1 amp. If using battery, check battery life and/or shelf life. Service or replace with new battery as required.
	Incorrect valve settings or loose test connections.	Check all valve settings for correct settings and check all connections for security of attachment.
Digital manometer does not read less than 1.5 in. H ₂ O when adapter E is separated.	Valve plate stuck.	Examine valve plate. Replace valve if suspect.
MASK ASSEMBLY - OVERALL LEAKAGE TEST		
Digital manometer does not read between 1.95 and 2.0 in. H ₂ O.	Incorrect valve settings or loose test connections.	Check all valve settings for correct settings and check all connections for security of attachment.
	Pusher fan faulty or power supply not set to correct settings. Dead or low battery.	Ensure power supply is set at 3.75V @ 1 amp. If using battery, check battery life and/or shelf life. Service or replace with new battery.
	Neck seal not correctly seated on neck seal test stand.	Seat correctly.
	Hood outlet valve open or valve not seated correctly.	Seat valve to closed position. Examine for dirt/dust. Clean as necessary.

Table 3-4. Respirator Assembly - Troubleshooting (Cont)

Trouble	Probable Cause	Remedy
Digital manometer does not read between 1.95 and 2.0 in. H ₂ O. (Cont)	Hole/split in rubber cowl or neck dam.	Examine for tears/holes. Replace if tears or holes are present.
	Holes/splits in mask inlet hose or hood inlet hose.	Examine for tears/holes. Replace if tears or holes are present.
	Occluded mask or hood inlet hose.	Ensure free from kinks.
	Drink Facility.	Examine for leaks and security of attachment.
HOOD ASSEMBLY - OVERALL LEAKAGE TEST		
Digital manometer does not read between 1.95 and 2.0 in. H ₂ O.	Pusher fan faulty or power supply not set to correct settings. Dead or low battery.	Ensure power supply is set at 3.75V @ 1 amp. If using battery, check battery life and/or shelf life. Service or replace with new battery as required.
	Neck seal not correctly seated on neck seal test stand.	Seat correctly.
	Hood outlet valve open or valve not seated correctly.	Select valve to closed position. Examine for dirt/dust. Clean as necessary.
	Hole/split in rubber cowl or neck dam.	Examine for tears/holes. Replace if tears or holes are present.
	Incorrect valve settings or loose test connections.	Check all valve settings for correct settings and check all connections for security of attachment.

3-126. DISASSEMBLY.

3-127. Instructions for disassembling the A/P23P-14A(V) respirator assembly are contained in the following paragraphs. Disassemble respirator assembly only as far as is required to correct malfunctions. Disassembly instructions can be followed in sequence for complete disassembly, or each step can

be done separately, as required for that specific part or subassembly. All damaged or affected parts shall be replaced when the respirator assembly is disassembled. All replacement parts shall have the same part number as the damaged or removed part. To disassemble respirator assembly or any of its components, proceed as follows:

CAUTION

Only parts listed in the Illustrated Parts Breakdown (IPB) are authorized to be disassembled.

Materials Required

Quantity	Description	Reference Number
As Required	Latex Coating, SPRAYLAT A	—

Support Equipment Required

Quantity	Description	Reference Number
1	Screwdriver, Jeweler's	—
1	Pliers, side-cutting, 4 in.	—
1	Screwdriver, 6 X 1/8 in STD	—
1	Pliers, flat nose, 4-3/4-in.	—
1	Wrench, socket 1/4-in. square drive	—
1	Pincer Tool, Low Profile	Oetiker 14100055
	or	
1	Pliers, Hose Clamp	NIIN 01-073-4187
1	Nut Driver, 3/8-in.	GGG-W-657

CAUTION

All replacement/disassembly, inspection, repair, and assembly must be done on benches having good lighting.

Apply a latex coating to outside visual area of faceplate before disassembly to protect optical area of faceplate from damage. Refer to [paragraph 3-118](#), for application instructions. The velveteen cover may be installed over the visual area when latex coating (SPRAYLAT) is not available or time is not sufficient to permit drying.

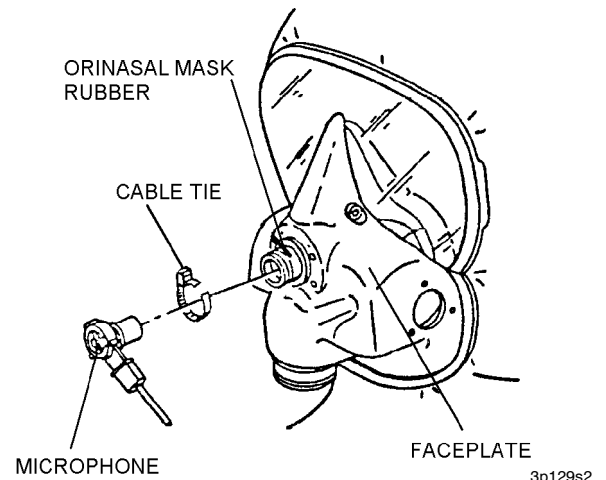
3-128. MCK-3A/P MASK COMPONENTS REMOVAL.
3-129. Microphone Removal.

1. Using side cutting pliers, remove and discard cable tie that secures orinasal mask rubber to microphone, taking care not to damage orinasal mask rubber.

2. Carefully remove microphone from orinasal mask by twisting exposed portion of microphone, while at the same time pushing microphone out from inside of orinasal mask.

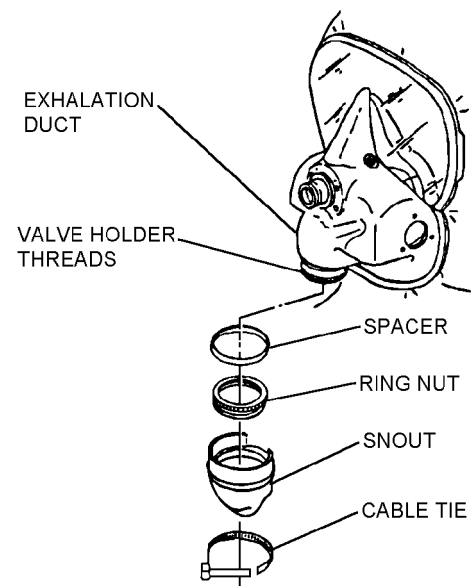
CAUTION

Do not use pigtail as a lever to remove microphone - it will break.


Step 2 - Para 3-129
3-130. Snout Removal.

1. Remove rubber snout by cutting cable tie and easing snout from ring nut of exhalation outlet valve holder.

2. If removing orinasal mask, remove ring nut and spacer that clamps orinasal mask to faceplate.


Steps 1 and 2 - Para 3-130

3-131. Drink Facility Removal.



Be careful not to damage external drink tube when removing cable tie. If drink tube is cut, nicked, or damaged in any way, discard and replace with new drink tube.

NOTE

In order to remove Drink Facility Assembly from mask, orinasal mask removal will be required.

1. If not previously accomplished, remove microphone by first cutting cable tie securing it in orinasal mask cavity, then gently pushing it out of cavity from inside the hood.

2. Invert hood to expose the orinasal mask.

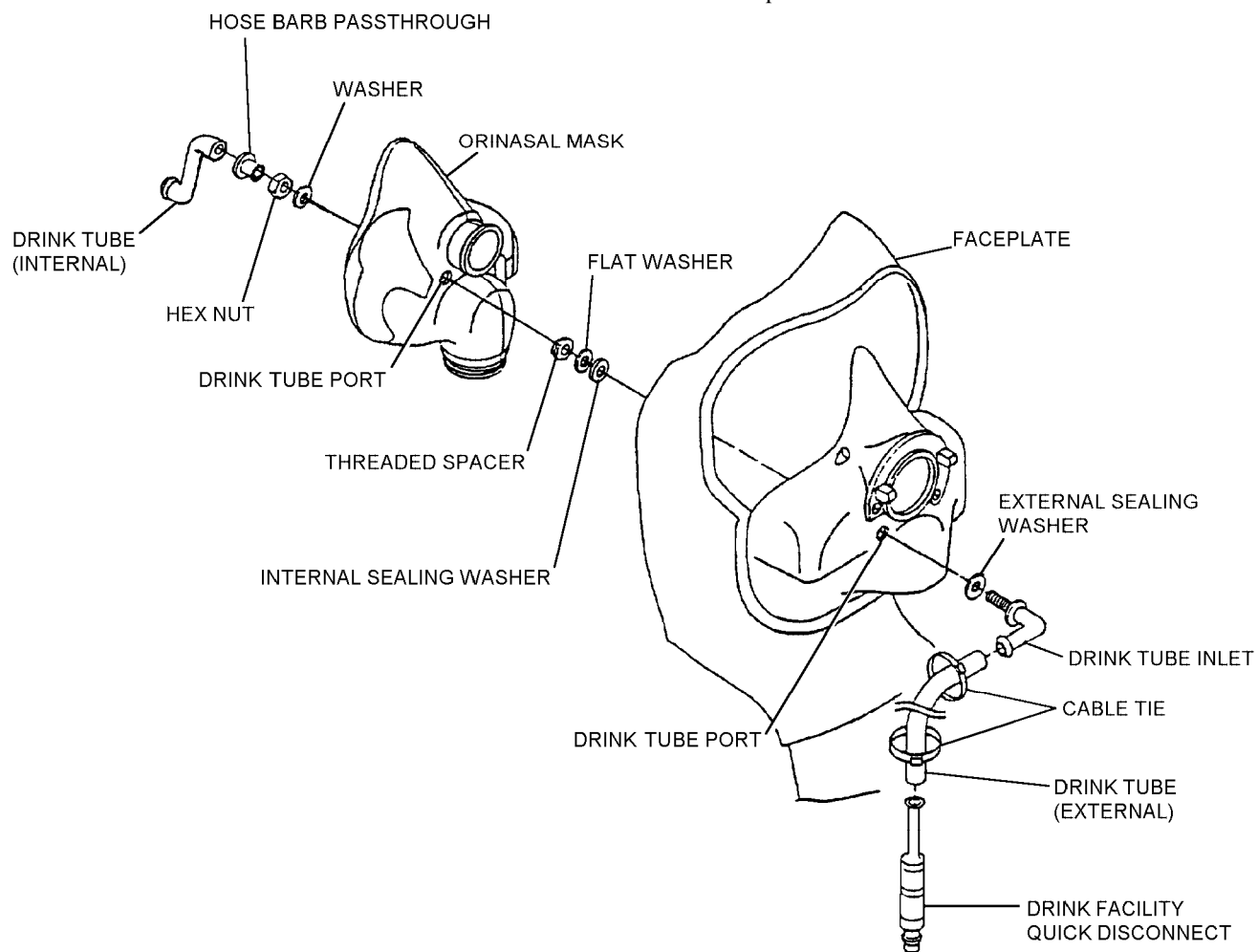
3. Carefully remove internal drink tube from hose barb pass through.

4. Using a 3/8-inch nut driver, remove and retain hose barb pass through and underlying hex nut from drink tube inlet. Remove and retain flat metal washer from drink tube inlet.

5. Carefully pull orinasal mask over threaded end of drink tube inlet in order to expose threaded spacer, flat metal washer and internal sealing washer between orinasal mask and faceplate.

6. Using a 3/8-inch nut driver, remove and retain threaded spacer. Remove and retain flat metal washer and internal sealing washer.

7. Remove drink tube inlet and external sealing washer from outside of faceplate by pulling it away from faceplate.



Steps 1 thru 7 - Para 3-131

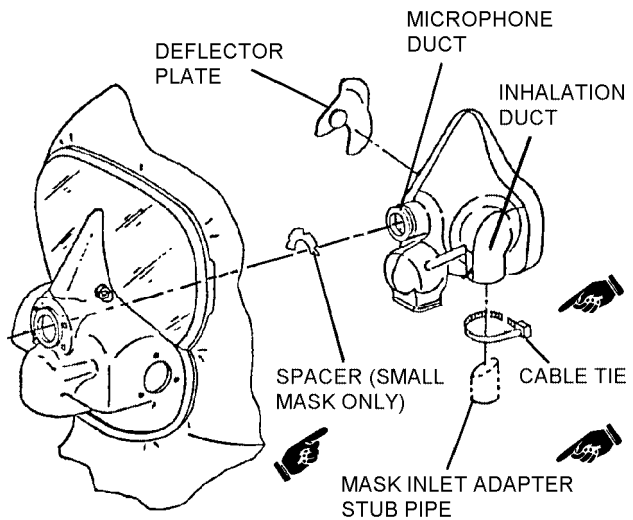
3p131s1

3-132. Orinasal Mask Removal.



Ensure components in paragraphs 3-129 and 3-130 have been removed prior to removing orinasal mask. Also ensure that paragraph 3-131, steps 1 through 3 have been completed.

1. Invert hood to expose orinasal mask.
2. Cut, remove and discard the cable tie securing orinasal mask inhalation duct to the mask inlet adapter.
3. Remove orinasal mask from within faceplate. If disassembling a small orinasal mask, remove and retain spacer.
4. Remove orinasal mask deflector plate, if required.
5. If needed, complete disassembly of drink facility assembly in accordance with steps 4 through 7, paragraph 3-131.



Steps 1 thru 5 - Para 3-132

3p132s1



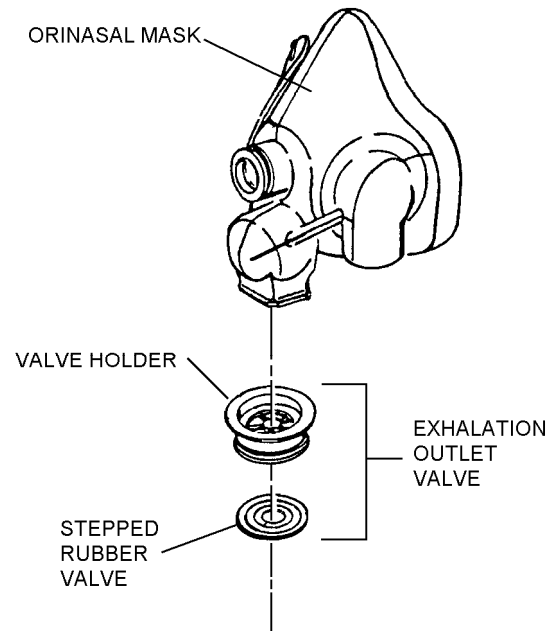
Ensure components in steps 1 through 4 have been removed prior to removing exhalation outlet valve. If only stepped rubber valve is to be removed, microphone, drink facility and orinasal mask removal will not be necessary. Carefully pull stepped rubber valve off valve holder.

3-133. Exhalation Outlet Valve Removal.

NOTE

If removing only stepped rubber valve, it is not necessary to perform procedures in paragraphs 3-129, 3-131 or 3-132.

1. Ease exhalation outlet valve from orinasal mask duct.

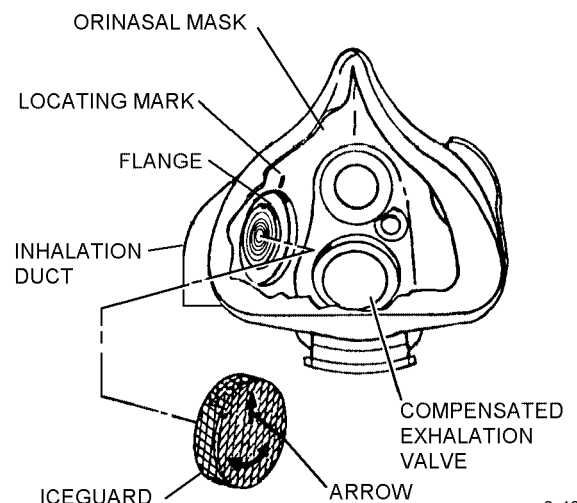


Step 1 - Para 3-133

3p133s1

3-134. Iceguard and Inhalation Valve Removal.

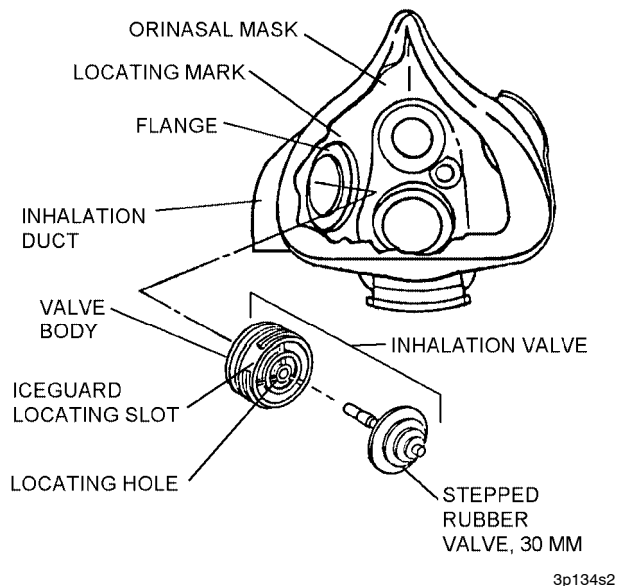
1. Remove iceguard by rotating iceguard body until engraved arrow is in line with mark molded on orinasal mask interior.



Step 1 - Para 3-134

3p134s1

2. Remove inhalation valve by easing its valve body from flange of orinasal mask.



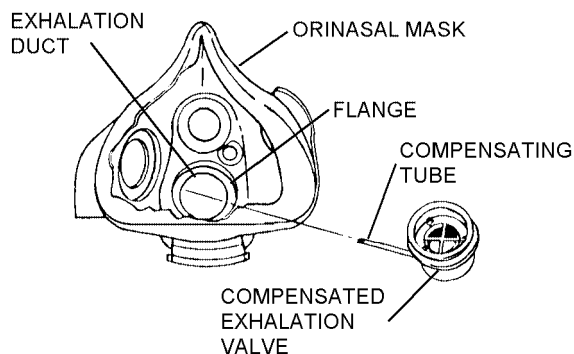
Step 2 - Para 3-134

3-135. Compensated Exhalation Valve Removal.



Ensure orinasal mask has been removed, as specified in [paragraph 3-132](#).

1. Remove compensated exhalation valve body from its securing flange by gently pushing into orinasal mask cavity from exhalation duct.
2. Carefully withdraw compensating tube from within connecting passage.



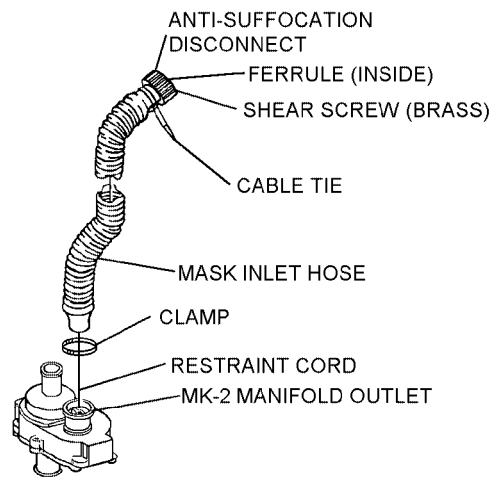
Steps 1 and 2 - Para 3-135

NOTE

Compensated exhalation valve is not to be dismantled. If defective, valve shall be replaced.

3-136. Mask Inlet Hose/Anti-Suffocation Disconnect Removal.

1. Remove shear screw (brass) from anti-suffocation disconnect and disengage from the mask inlet adapter.
2. Disconnect restraint cord from ferrule located within the anti-suffocation disconnect. Retain ferrule.
3. Cut, remove and discard cable tie securing mask inlet hose to the anti-suffocation disconnect.
4. Pry mask inlet hose from the anti-suffocation disconnect.
5. Using low profile pincer, remove and retain stepless low profile clamp securing the mask inlet hose to left MK-2 manifold outlet port.
6. Remove mask inlet hose from manifold. Discard and replace hose if damaged.

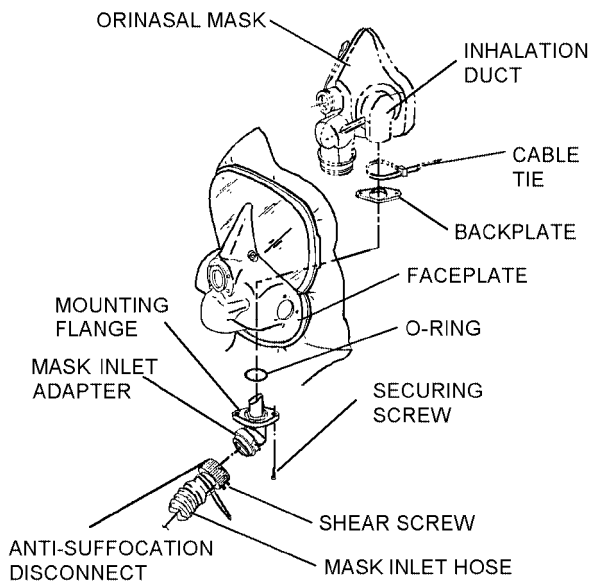


Steps 1 thru 6 - Para 3-136

3-137. Mask Inlet Adapter Removal.

1. Remove shear screw (brass) from the anti-suffocation disconnect. Disengage anti-suffocation disconnect from mask inlet adapter if not done previously in [paragraph 3-136](#).
2. Remove two screws securing mask inlet adapter to faceplate.

3. Invert hood to expose inner side of mask.
4. Cut and discard cable tie securing orinatal mask to mask inlet adapter if not previously done in [paragraph 3-132](#).
5. Withdraw mask inlet adapter from the faceplate.
6. Remove backplate.
7. Remove and discard sealing O-ring.

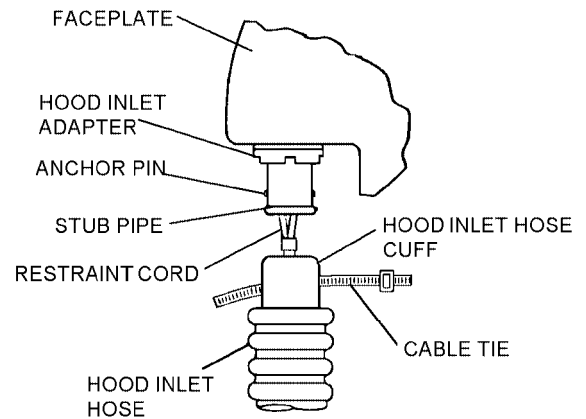


Steps 1 thru 7 - Para 3-137

3p137s1

3-138. Hood Inlet Hose Removal.

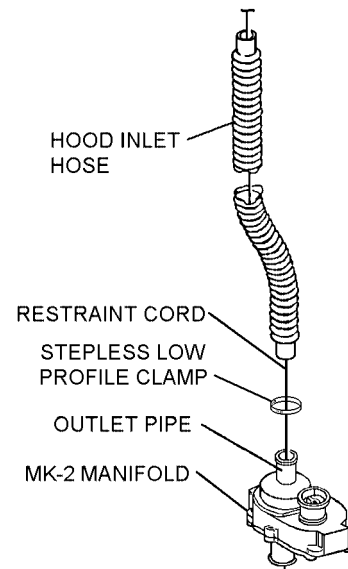
1. Cut, remove and discard cable tie securing hood inlet hose to hood inlet adapter.
2. Pry hood inlet hose off hood inlet adapter.
3. Remove and discard the PVC tape covering restraint cord anchor pin.
4. Withdraw and retain hood restraint cord anchor pin from within duct of hood inlet adapter using flat nose pliers.



3p138s1

Steps 1 thru 4 - Para 3-138

5. Using low profile pincer tool, remove and retain (if not damaged) stepless low profile clamp (16.5 mm P/N CL 6592) securing hood inlet hose to MK-2 manifold.
6. Ease hood inlet hose from MK-2 manifold and remove hose. Leave restraint cord attached to manifold.
7. If damaged, discard and replace hood inlet hose.



3p138s5

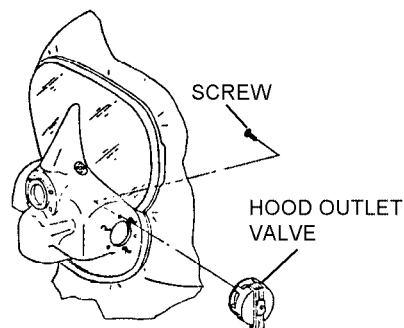
Steps 5 thru 7 - Para 3-138

3-139. Hood Inlet Adapter Removal.

1. Remove hood inlet hose as specified in [paragraph 3-138](#) if not already done.

NAVAIR 13-1-6.10

2. Remove hood inlet spanner nut securing hood inlet adapter to faceplate.
3. Remove facing washer.
4. Invert hood to expose inner side of mask.
5. Remove hood inlet adapter and discard sealing washer.

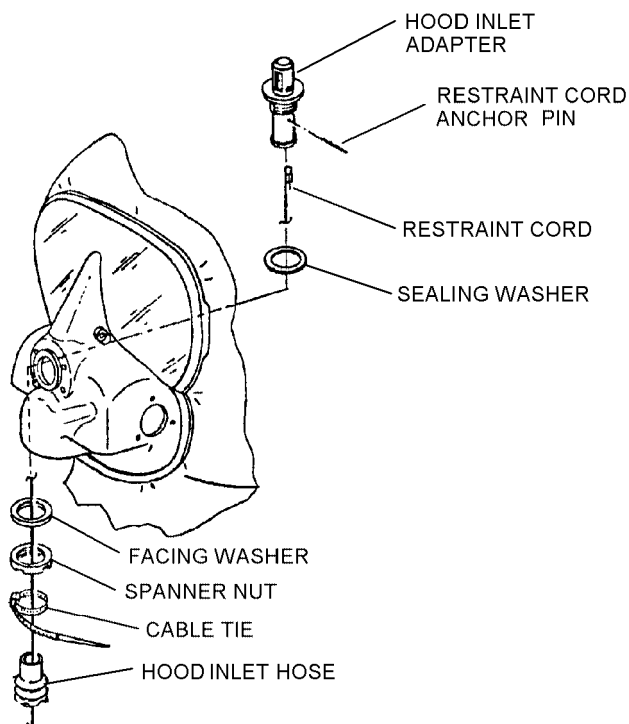


3p140s1

Steps 1 thru 3 - Para 3-140

3-141. Nose Occluder Removal.

1. Remove the C-clips from nose occluder stirrup.
2. Remove facing washers.
3. Invert hood to expose inner side of mask.
4. Ease shaft assembly through nose occluder stirrup, then through faceplate bushing.
5. Remove shaft assembly from mask.
6. Remove two rubber O-ring seals from shaft assembly and discard.



3p139s1

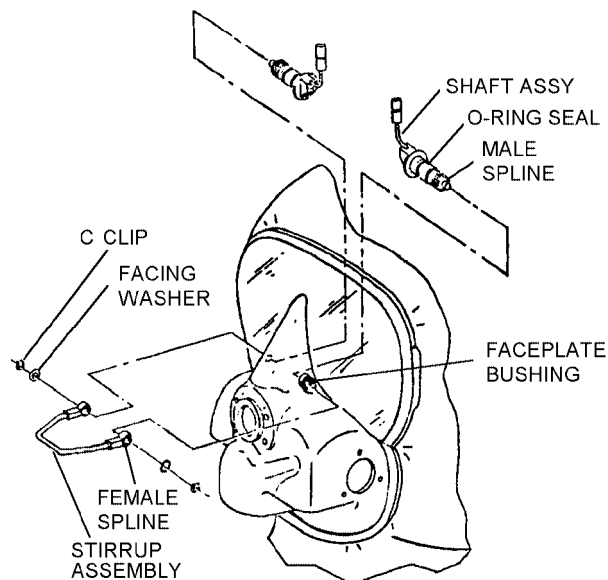
Steps 1 thru 5 - Para 3-139

3-140. Hood Outlet Valve Removal.



Ensure orinasal mask is removed as specified in [paragraph 3-132](#).

1. Invert hood to expose inner side of mask.
2. Remove and retain three screws securing hood outlet valve to orinasal mask.
3. Remove valve assembly.



3p141s1

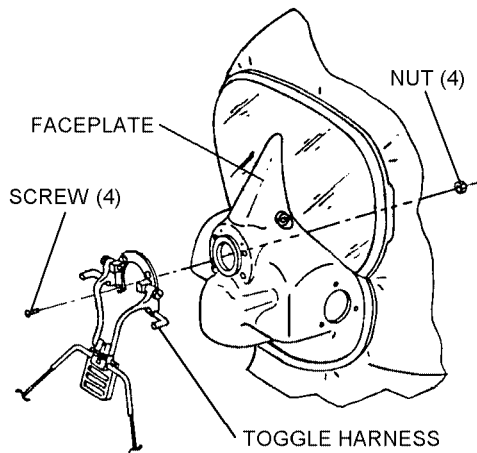
Steps 1 thru 6 - Para 3-141

3-142. Toggle Harness Removal.



Ensure orinasal mask is removed as specified in [paragraph 3-132](#).

1. Invert hood to expose inner side of mask.
2. Remove four screws and nuts securing toggle harness to faceplate. Retain hardware.

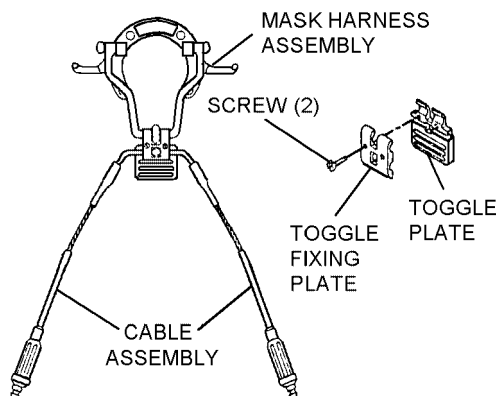


3p142s1

Steps 1 and 2 - Para 3-142

3. Remove two screws to remove toggle plate and toggle fixing plate from harness assembly.

4. Remove two cable assemblies.



3p142s3

Steps 3 and 4 - Para 3-142

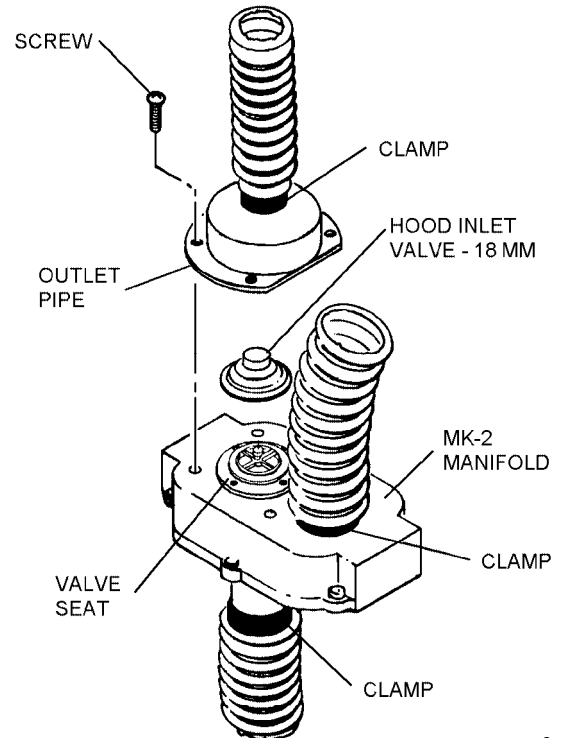
3-143. Hood Inlet Valve Removal.

1. Remove four screws securing outlet pipe to the MK-2 Manifold, and remove the outlet pipe.

2. Inspect valve for dirt and debris, clean with water if necessary.

3. If valve is defective, grasp by the center stub and lift it off metal stem on valve seat.

4. Install new valve and reassemble outlet pipe to MK-2 Manifold using a thin coating of sealing compound on screws.



3p143s1

Steps 1 thru 4 - Para 3-143

5. Retest.

3-144. LOWER ASSEMBLY REMOVAL.

3-145. MK-2 Manifold Removal.

3-146. Mask Inlet Hose. Carefully remove and retain (if not damaged), stepless low profile clamp securing mask inlet hose to left outlet port of manifold so as not to damage the mask inlet hose or outlet port. Pry mask inlet hose off manifold left outlet port ([figure 3-48](#)).

3-147. Hood Inlet Hose. Carefully remove and retain (if not damaged), stepless low profile clamp securing hood inlet hose to right outlet port of manifold so as not to damage hood inlet hose or outlet port. Pry the hood inlet hose off of right outlet port ([figure 3-48](#)).

3-148. Manifold Hose. Carefully remove and retain (if not damaged), stepless low profile clamp securing manifold hose to inlet port so as not to damage inlet port. Pry manifold hose off of inlet port. ([figure 3-48](#)).

3-149. Pusher Fan Subassembly Removal (figure 3-49).

3-150. Manifold Hose (3/4 inch - 7/8 inch). Carefully remove and retain (if not damaged) the stepless low profile clamp securing manifold hose to J-manifold so as not to damage J-manifold port. Pry manifold hose off port. Retain manifold hose.

3-151. J-Manifold and Gasket. Unscrew J-manifold from the C2 or C2A1 canister. Retain J-manifold. Pull J-manifold gasket from threaded end of J-manifold. Retain gasket.

3-152. Pusher Fan and C2 or C2A1 Canister. Carefully cut, remove, and discard cable tie securing pusher fan to C2 or C2A1 canister. Pull pusher fan off of C2 or C2A1 canister. Retain pusher fan and C2 or C2A1 canister.

3-153. Pusher Fan Battery. Disconnect battery from pusher fan by grasping and pulling pusher fan plug from battery. Retain battery for storage or recharge.

3-154. CLEANING OF DISASSEMBLED COMPONENTS.

3-155. Disassembled component parts of the A/P23P-14A(V) Respirator Assembly shall be thoroughly cleaned to remove all traces of sealing compound, sealing varnish, lubricant, and other foreign matter such as dirt, sand, dried liquid nourishment, or vomit. If internal compartments of valves and hoses cannot be thoroughly cleaned, they shall be replaced. Cleaning of disassembled components shall be performed by a qualified Aircrew Survival Equipmentman (PR). Cleaning procedures are as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Toothpick	—
As Required	Swab, Cotton	—
As Required	Soap Mild	—
As Required	Cloth, Cotton	—
As Required	Pad, Gauze	—
As Required	Solvent, Toluene	NIIN 00-281-2002
As Required	Alcohol, Isopropyl Rubbing	TT-I-735 NIIN 00-655-8366
1	Brush, Sable	—
As Required	Water	—
As Required	Towelettes, SANI-COM,	No. 3205 (CAGE 18195)

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Bleach, Laundry	A-A-1427 NIIN 00-598-7316
As Required	Cleaner, Tobacco Pipe	—
1	Brush, Acid	NIIN 00-514-2417
As Required	Cleaning Compound, Type 1	MIL-C-43616
As Required	Cloth, Abrasive	—
As Required	Cloth, Cotton	—
1 pr.	Gloves, Acrylonitrile rubber or Neoprene	—



When cleaning mask, do not allow solvent to come in contact with the faceplate.

Velveteen covers are not to be used for cleaning or polishing.

3-156. MCK-3A/P MASK ASSEMBLY CLEANING.

3-157. Toggle Harness Cleaning.

1. Remove all traces of sealing compound (silicone rubber) using a gauze pad. If necessary, gently scrape sealing compound with fingernail or toothpick to loosen it.

2. Remove sealing compound from toggle harness and four attaching screws in a similar manner.

3-158. Nose Occluder Cleaning.

1. Clean lubricant from nose occluder shaft assemblies and faceplate bushings with a cotton swab using mild soap and warm water.

2. Rinse soap from shaft assemblies using a cotton swab and warm water.

3. Wipe shaft assemblies with a clean dry cloth. Allow to air dry completely.

3-159. Hood Outlet Valve Cleaning.

1. Remove all traces of sealing compound (silicone rubber) from around the areas of hood outlet port of faceplate using a gauze pad. If necessary, gently scrape sealing compound with fingernail or toothpick to loosen it.

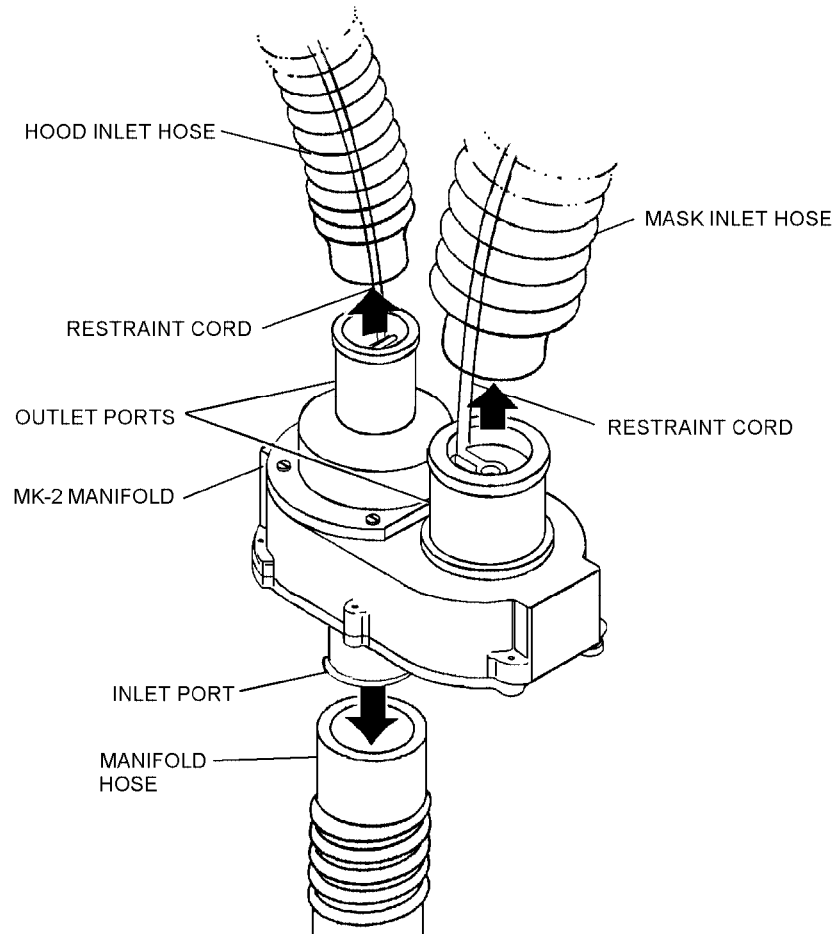


Figure 3-48. Removal of Hoses from MK-2 Manifold

3-48

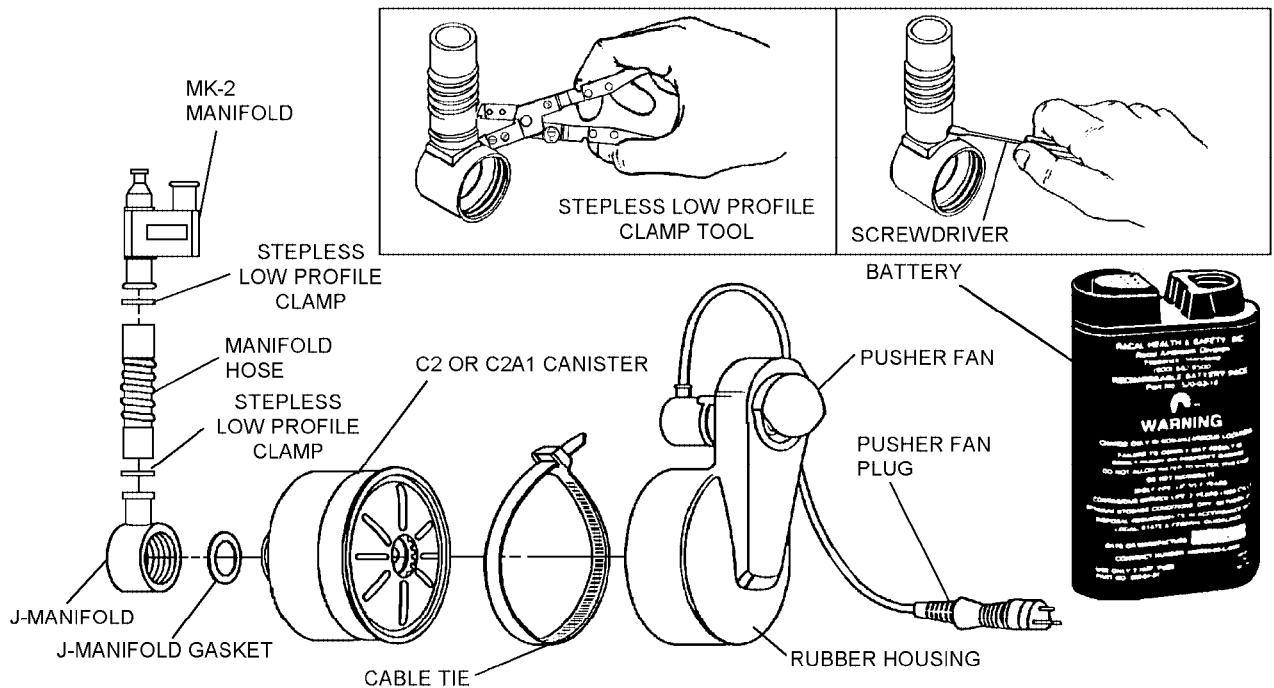


Figure 3-49. Disassembly of Lower Assembly

3-49

2. Remove sealing compound from the hood outlet valve and three attaching screws in a similar manner.

3-160. Hood Inlet Adapter Cleaning.

1. Remove any traces of sealing varnish or sealant from outer surface of hood inlet adapter using a gauze pad moistened with solvent.

2. Wipe cleaned surfaces dry using a clean, dry gauze pad.

3-161. MK-2 Manifold Ports Cleaning.

1. Clean surface of manifold ports using a gauze pad moistened with solvent.

2. Wipe cleaned surfaces dry using a clean, dry gauze pad.

3-162. Mask Inlet Adapter Cleaning.

1. Remove all traces of sealing compound (silicone rubber) from around areas of mask inlet adapter, back plate and faceplate using a gauze pad. If necessary, gently scrape sealing compound with a fingernail or toothpick to loosen it.

2. Remove sealing compound from attaching screws in a similar manner.

3-163. Anti-Suffocation Disconnect Cleaning.

1. Remove any traces of sealing varnish from outer surface of manifold outlet port using a gauze pad moistened with solvent.

2. Wipe cleaned surfaces using a clean, dry gauze pad.



The compensated exhalation valve must be removed from orinasal mask before internal cleaning with isopropyl alcohol.

3-164. Compensated Exhalation Valve Cleaning.

1. Add isopropyl alcohol to a container of sufficient size to partially submerge compensated exhalation valve.

NOTE

Valve plate cannot be depressed while compensating tube is covered.

2. Cover end of compensating tube with finger to prevent alcohol from entering tube.

3. Submerge valve in alcohol and using a sable brush, gently clean the valve.

4. Gently shake excess alcohol from valve and allow to air dry.

3-165. Inhalation Valve Cleaning.

1. Turn iceguard 90° and lift it from the inhalation valve assembly.



Do not clean inhalation valve with SANI-COM towelettes or sanitizing solution.

2. Gently lift valve with finger and clean underside of valve and valve seat with a sable brush moistened with water.

3. Clean top of valve in same manner.

4. Allow to air dry.

5. Clean iceguard with a sable brush and water to remove any foreign particles from mesh.

6. Allow to air dry.

3-166. Snout and Exhalation Outlet Valve Cleaning.

1. Remove snout to expose exhalation outlet valve (paragraph 3-130). Cut cable tie and ease snout from ring nut of exhalation outlet valve holder.

2. Grasp raised rubber knob at valve center and pull valve off its seating pin.



Do not clean inhalation or exhalation valves with SANI-COM towelettes or sanitizing solution.

3. Clean both sides of valve, and valve seat using a sable brush moistened with water.
4. Set valve aside to air dry with knob side of valve facing down on bench. Allow valve seat area to air dry.
5. Reinstall valve on seating pin, ensuring it is fully seated on pin.
6. Clean snout with a gauze pad moistened with water.
7. Wipe dry with a clean, dry cotton cloth.

3-167. Drink Tube Cleaning.

1. Remove all traces of sealing compound (silicone rubber) from drink tube's mounting flange, backing plate, hex nut, and screw using a gauze pad. If necessary, gently scrape sealing compound with fingernail or toothpick to loosen it.
2. Remove all traces of sealing compound from faceplate's drink tube port in a similar manner.

3-168. Orinasal Mask Cleaning.

1. Avoiding the valves, clean internal surfaces of the orinasal mask with cleansing towelettes (SANI-COM No. 3205) being sure to wipe under rolled-over edges of orinasal mask.
2. Wipe the microphone with a towelette.
3. Allow to air dry.

3-169. Faceplate, Hood, Hoses, Apron, and Neck Seal Cleaning.



Abrasive cleaners, adhesives, and solvents must not be applied to visual areas of faceplate. Velveteen covers are not to be used for cleaning or polishing.



Damage or scratches to the faceplate cannot be repaired. Use care when cleaning the faceplate.

1. Clean the inner visual area of the faceplate using water with a soft cotton cloth or dampened cham-
ois.
2. Wipe faceplate with clean, dry cotton cloth to remove excess water.
3. Allow to air dry.
4. Clean interior and exterior surfaces of hood, apron, and neck seal with a gauze pad moistened with water.
5. Clean all hoses with gauze pad moistened with water.
6. Wipe excess water from hood, apron, and neck seal using a clean, dry cotton cloth.
7. Allow to air dry.

3-170. LOWER ASSEMBLY CLEANING.

3-171. MK-2 Manifold Cleaning.

3-172. Metallic Components.

1. Remove any traces of sealing varnish from outer surface of the MK-2 manifold inlet and outlet ports using a gauze pad moistened with solvent.
2. Wipe cleaned surface dry using a clean, dry gauze pad.

3-173. Hood Inlet Valve.



When cleaning hood inlet valve, apply only moderate pressure so as not to damage the valve.

1. Remove hood inlet valve in accordance with [paragraph 3-143](#).
2. Soak hood inlet valve in water for five minutes. Components shall be fully submerged and cleaned using a soft brush or clean lint-free cloth.
3. After the soaking is complete, remove hood inlet valve using acrylonitrile rubber, or neoprene gloves, and place on a clean surface, preferably a lint-free cloth.
4. Cover all parts until dry.

5. Install valve and reassemble outlet pipe to MK-2 manifold using a thin coating of sealing compound on screws.

6. If parts are not to be immediately assembled, package in approved plastic bags.

3-174. Pusher Fan Subassembly Cleaning.

3-175. J-Manifold and Gasket. Remove any traces of adhesive or lubricant from outer surface of J-manifold port using a gauze pad moistened with solvent. If necessary, scrape residual adhesive with fingernail or toothpick to loosen. Clean J-manifold gasket using a gauze pad moistened with water and allow to air dry. Wipe cleaned surfaces dry using a clean dry gauze pad.

3-176. Pusher Fan. Remove pusher fan assembly from respirator assembly by carefully cutting cable tie that secures the C2 or C2A1 canister to pusher fan. Remove C2 or C2A1 canister from pusher fan. Clean internal and external surfaces of pusher fan with cleansing towelettes. Moisten gauze pad with water and squeeze to remove excess to prevent dripping. Wipe pusher fan interior and pusher fan inlet. Allow to air dry.

3-177. C2 or C2A1 Canister. Clean, using a cleansing towelette to remove dirt, grime or any other debris from external surfaces or threads. Wipe cleaned surfaces dry using a clean dry gauze pad. Be sure no moisture remains inside canister.

3-178. Battery. Clean, using a cleansing towelette to remove dirt, grime or any other debris from the external surfaces. If dirt or debris is found in the battery receptacle, it should be removed using a toothpick or pipe cleaner. If 3-pin receptacle is corroded, battery pack should be replaced. Wipe cleaned surfaces dry using a clean dry gauze pad.

3-179. PROCEDURES AND CRITERIA FOR REPLACEMENT OF FILTER CANISTERS.

3-180. C2 OR C2A1 CANISTER REPLACEMENT.

The C2 or C2A1 canister is the only filter canister recommended for use with the A/P23P-14A(V) respirator assembly. They are designed to remove toxic and/or irritating chemical vapors, gases, and particulate contaminants including biological organism likely to be used in warfare. Protective capability can be affected by environmental conditions. Hot and humid climates will degrade protection after two months, basic cold climates after twenty-four months, and all other climates after twelve months. Unit NBC officers will provide specific instructions for replacement depending on the unique tactical situation.

WARNING

Only the C2 or C2A1 canister (NIIN 01-119-2315) shall be used as part of A/P23P-14A(V) Respirator Assembly.

Wear protective mask and clothing, in accordance with local standard operating procedures, when replacing or disposing of a canister that has been exposed to a toxic agent.

J-manifold gaskets are occasionally displaced from manifold when C2 or C2A1 canister is removed. Visual inspection to ensure that the gasket is in place must be performed when C2 or C2A1 canisters are removed or installed.

Filter canisters do not provide protection against ammonia gas or carbon monoxide. Protection against sulfur dioxide gas can be provided for only 5 to 10 minutes.

3-181. Criteria for C2 or C2A1 Replacement. Replace canisters after any of the following occurrences:

1. Physical damage.
 - a. Canister is cracked, split, dented on a seam, dented deeper than 1/4 inch, crushed or has holes.
 - b. Threads are damaged or dented.
 - c. Lip of threaded neck is dented in excess of 1/32 inch deep.
 - d. Body of canister has rust or pitting.
 - e. Seams have excessive rust (approximately greater than 10% of seam length).
2. Canister has been immersed in water.
3. Canister inlets clogged with dirt, oil, grease, or other foreign matter.
4. Excessive resistance to airflow or an increase in breathing resistance is felt.
5. The lot number of canister is listed as unserviceable in SB 3-30-2.
6. CB agent contamination.

NOTE

Upon its availability, refer to U.S. Navy/ U.S. Marine Corps Nuclear, Biological & Chemical (NBC) Defense Handbook for detailed procedures for disposition of contaminated canisters. Until its issuance refer to the U.S. Army Field Manual, FM 3-5, NBC Decontamination and the Naval Aviation Nuclear, Biological, and Chemical Defense Resource Manual.

a. Canisters have been exposed to any agents for any period of time exceeding twenty-four hours under battlefield conditions during typical missions.

b. Prior to a mission where CB agents may be employed.

7. When directed by unit commander or higher authority.

3-182. Canister Replacement Procedures.

1. Carefully cut, remove, and discard cable tie securing pusher fan to C2 or C2A1 canister.

2. Remove pusher fan from C2 or C2A1 canister and retain.

3. Unscrew (counterclockwise) C2 or C2A1 canister from J-manifold.

4. Remove and inspect J-manifold gasket.

NOTE

Replace with new gasket only if damage or deterioration is evident.

5. Clean J-manifold using a gauze pad moistened with isopropyl alcohol and allow to air dry.

6. Clean gasket using a gauze pad moistened with water and allow to air dry.

7. Clean pusher fan.

8. Reinstall J-manifold gasket ensuring gasket is fully seated and flat. Gasket should be below threads in J-manifold canister opening.

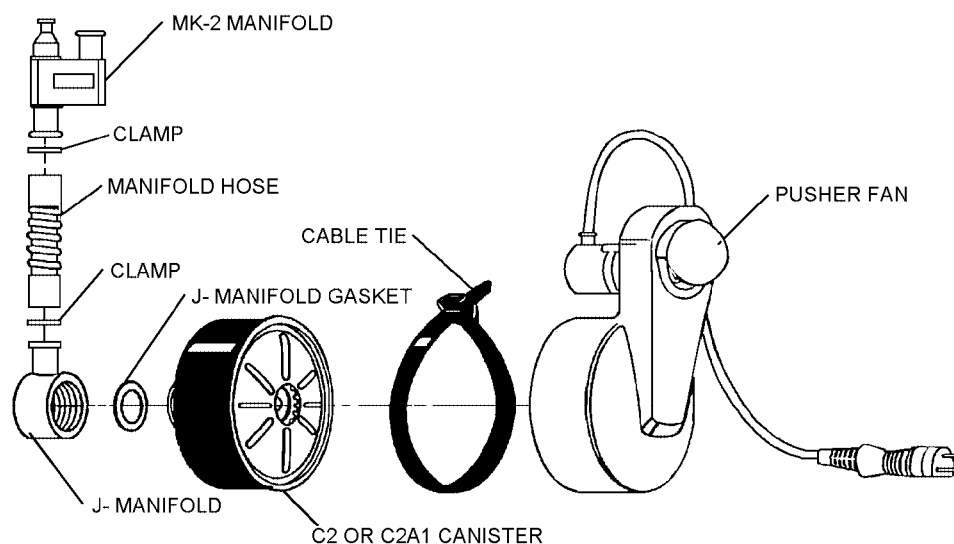
9. Screw replacement C2 or C2A1 canister clockwise into J-manifold until hand tight.

NOTE

Ensure canister plug and cap are removed.

10. Slide pusher fan rubber housing over C2 or C2A1 canister until canister lip bottoms in rubber housing. Ensure pusher fan is positioned as shown.

11. Using cable tie tool preset to HVY (No. 8) setting, install cable tie around rubber housing to secure canister inside rubber housing. Ensure cable tie connection is tight.



Steps 8 thru 11 - Para 3-182

3p182s8

3-183. Pusher Fan Battery. Plug pusher fan cord into battery pack. Be careful when inserting plug to avoid breaking off any of the prongs. Ensure plug bottoms out in battery socket.

3-184. ASSEMBLY.

3-185. Instructions for assembling the A/P23P-14A(V) Respirator Assembly are contained in the following paragraphs. The instructions can be followed in sequence for the complete assembly of respirator assemblies, or each step can be done separately as required for that specific part. To assemble respirator assembly or any of its components, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Sealing Compound, Type I, White	NIIN 00-877-8972
As Required	Lubricant, KRYTOX, Type II, 240 AC	NIIN 00-961-8995
As Required	Varnish, Sealing	TBD
As Required	Cloth, Cotton	—
As Required	Tape, PCV, 1/4-inch	—
As Required	Thread Locking Compound, Locktite 222	NIIN 01-085-3639
1	Adapter, Clip	1505165
As Required	Cable Tie, 4.8 mm	CL 6227
As Required	Cable Tie, 3.6 mm	CL 6226
As Required	Cable Tie, 2.4 mm	CL 6225
As Required	Cable Tie, 7.6 mm, 18 inch	CL 6528
As Required	Sealant, RTV 732	—
2	Stepless Low Profile Clamp (28.6 mm)	3297AS201-3
1	Stepless Low Profile Clamp (21.9 mm)	CL 6593
1	Stepless Low Profile Clamp (16.5 mm)	CL 6592
As Required	Adhesive	NIIN 00-117-8738
1	Applicator Brush	—
4	O-ring	—

Support Equipment Required

Quantity	Description	Reference Number
1	Cable Tie Tool, Heavy Duty	NIIN 00-937-5438
1	Elastrator	NIIN 01-124-0649
1	Pincer Tool, Low Profile	Oetiker 14100055
	or	
1	Pliers, Hose Clamp	NIIN 01-073-4187
1	Screwdriver, 6 X 1/8-inch Std	—
1	Screwdriver, Slot Head	—
1	Square Drive, 1/4-inch	—
1	Torque Driver	—
1	Cable Tie Tool, Standard	MS90387-1
1	Nut Driver, 1/8-inch	—
1	Nut Driver, 3/8-inch	GGG-W-657

NOTE

All parts must be cleaned in accordance with [paragraph 3-154](#) before assembly can begin.

Refer to [paragraph 3-109](#) for cable tie installation procedures.

Refer to [paragraph 3-110](#) for stepless low profile clamp installation procedures.

Repair of the MCK-3A/P Mask components other than hood, bellows and apron, shall be limited to replacement of defective parts as determined by inspection and troubleshooting.

3-186. MCK-3A/P MASK ASSEMBLY.

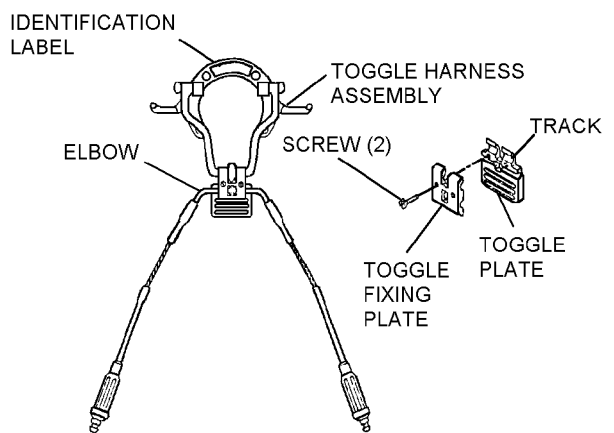
NOTE

In order to improve clarity of the illustration in the following mask assembly instructions, the toggle harness and nose occluder assemblies will appear only in figures addressing these items.

3-187. Toggle Harness Installation.

1. Place elbow portions of replacement cable assemblies (P/N 1505083) into track located on front of toggle plate.

2. Align mask harness assembly with upper lips of the toggle plate. Fasten toggle fixing plate to front of toggle plate using two screws.



Steps 1 and 2 - Para 3-187

3p187s1

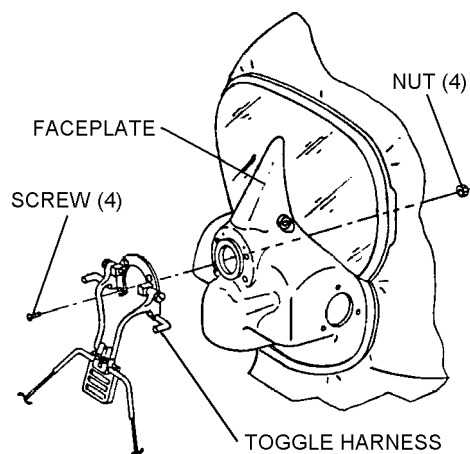
3. Coat the countersunk portions of the four mounting screws using sealing compound.

4. Fasten toggle harness assembly to faceplate using four coated screws.



Do not overtighten. Overtightening screws will crack polycarbonate faceplate.

5. Invert hood, attach and tighten nuts to screw entering faceplate using torque wrench set to 40-42 oz. in.



Steps 3 thru 5 - Para 3-187

3p187s3

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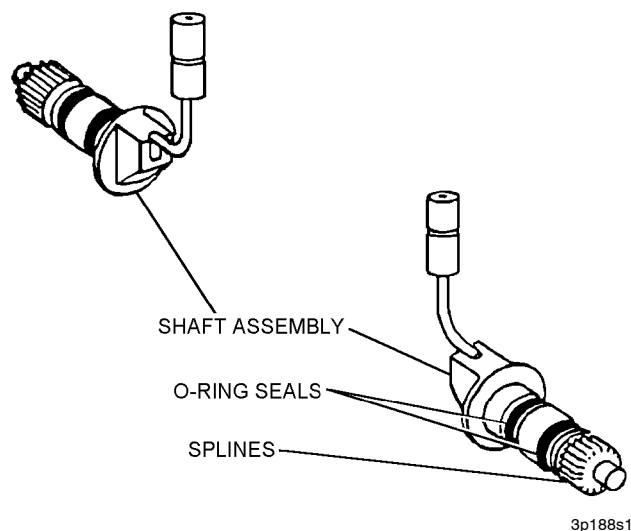
3-188. Nose Occluder Installation.**CAUTION**

When assembling nose occluder into mask, care should be taken not to force any parts together. Nose occluder and faceplate bushings which are in good working order should fit together snugly but easily. Bushings are black coated brass inserts which are press fitted into the faceplate and sealed with a silicone rubber sealant. Using excessive pressure could dislodge nose occluder faceplate bushings.

NOTE

It is suggested that prior to assembling nose occluder in mask, the shaft assemblies and stirrup be engaged several times to remove any excess coating on splines. If the splines do not engage smoothly after this, they may be out of specification and should be replaced. Use Krytox sparingly to ensure that shaft assembly splines will properly fit into the stirrup splines without excess force. There are no published repair procedures for either spline interference or faceplate bushings at this time.

1. After selecting proper nose occluder kit, before assembling nose occluder to stirrup assembly, apply Krytox lubricant to splined ends of nose occluder shaft assemblies. Work splines of both shaft assemblies in and out of stirrup assembly splines several times until male splines engage smoothly with female splines.

**Steps 1 and 2 - Para 3-188**

2. Inspect and lightly lubricate two O-ring seals on shaft assemblies.

3. Insert one shaft assembly through inside of faceplate bushing. Position roller portion of assembly flush against inner side of faceplate nose bridge and then engage splines. Repeat for opposite shaft assembly.

4. Position stirrup assembly to be fully down into outer portion of faceplate.

5. Maintain relative positions of shaft assemblies and stirrup, and then ease shaft assemblies through faceplate bushing to engage splines of stirrups.

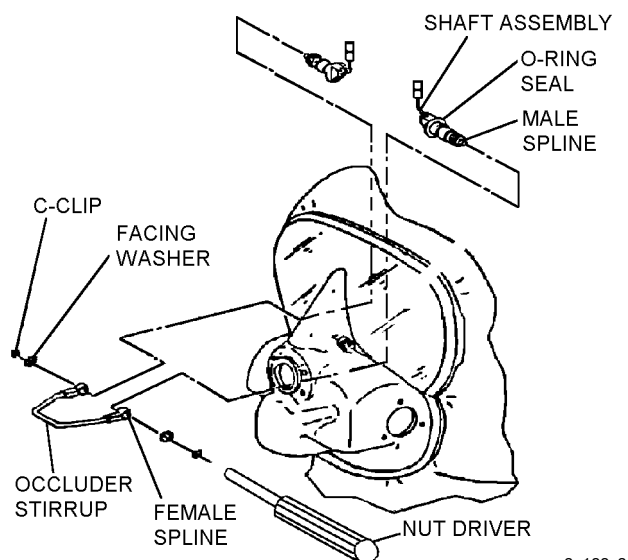
6. Ensure stirrup assembly is in down position. If right handed, use left hand inside of mask to support shaft assembly during C-clip installation, vice versa if left handed.

7. Ensure shaft assembly is completely seated through stirrup end. Place washer on shaft end. Ensure C-clip groove is visible with washer in place.

8. Apply Krytox to end of a 1/8-inch nut driver. Krytox will serve as an installation lubricant and will hold C-clip in place on nut driver.

9. Place C-clip on end of nut driver and adjust C-clip to be centered over nut driver opening.

10. Line up 1/8-inch nut driver directly over center of shaft end and press C-clip into groove. Verify C-clip is properly seated.

**Steps 3 thru 10 - Para 3-188**

11. Repeat steps 3 through 10 for opposite side.

3-189. Hood Outlet Valve Installation.

1. Coat threaded portions of the three securing screws with a thin, even coat of sealing compound (type I, white).

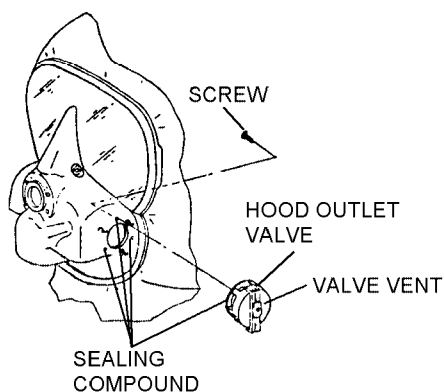
2. Apply an even film of sealing compound to mating surface of hood outlet valve and to faceplate joint. Place valve over hood outlet port with valve vent positioned to discharge towards rear of hood.



Do not overtighten. Overtightening screws will crack polycarbonate faceplate.

3. Install coated screws to secure valve into place. Tighten the screws with torque screwdriver set to 8-10 oz. in.

4. Remove any excess sealing compound using clean, dry absorbent cloth.



Steps 1 thru 4 - Para 3-189

3p189s1

3-190. Hood Inlet Adapter Installation.

1. Invert the hood to expose inner side of mask.

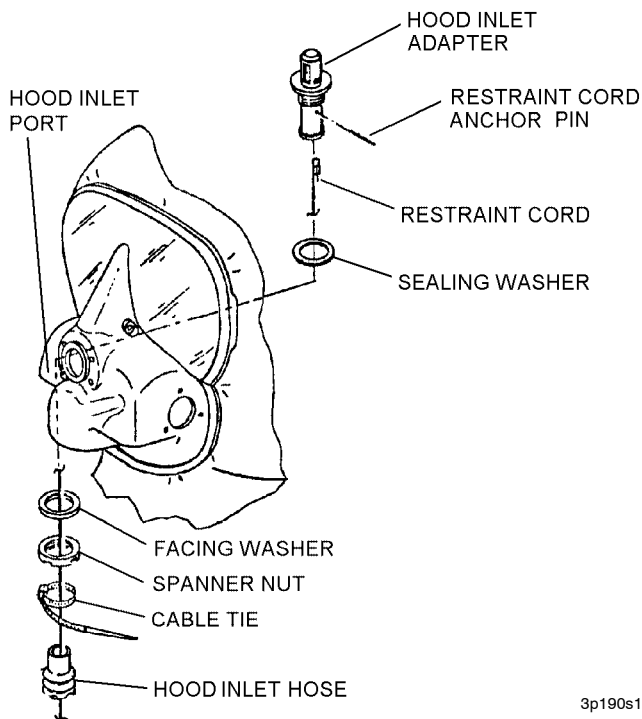
2. Position a new sealing washer (Part No. 1500835) and install hood inlet adapter through faceplate port, taking care to align flat side on adapter flange with molded flat on faceplate port.

3. Restore hood to its normal position.



Do not overtighten. Overtightening spanner nut will crack polycarbonate faceplate.

4. Install facing washer, then fit spanner nut. Tighten spanner nut using ring nut spanner attached to torque wrench set to 14-16 lb. in.



Steps 1 thru 4 - Para 3-190

3p190s1

5. Install hood inlet hose in accordance with [paragraph 3-191](#).

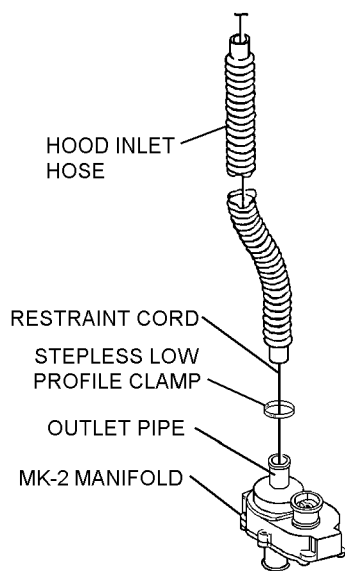
3-191. Hood Inlet Hose Installation.

1. Feed free end of restraint cord through hood inlet hose.

2. Install a 16.5 mm stepless low profile clamp (CL 6592) around hood inlet hose cuff. Position the locking head toward the wearer.

3. Engage cuff of hood inlet hose over manifold outlet pipe, then hand-seat cuff to fully engage hose on manifold outlet.

4. Using a low profile pincer, secure the stepless low profile clamp in place.



Steps 1 thru 4 - Para 3-191

3p191s1

5. Insert loop formed at free end of restraint cord into orifice of hood inlet adapter.

6. Fit restraint cord anchor pin through hood inlet adapter, engaging loop of restraint cord and terminating flush with sides of hood inlet adapter. Wrap one turn of PVC tape, 1/4 inch wide, around external circumference of the hood inlet adapter to overlay both ends of pin. Smooth the tape and apply without crease or wrinkle.

7. Apply a thin, even coat of sealing varnish to external surface of the stub pipe, taking care not to apply any sealing varnish to the inner surface of the hood inlet adapter.

8. Center loop of the restraint cord around the anchor pin.

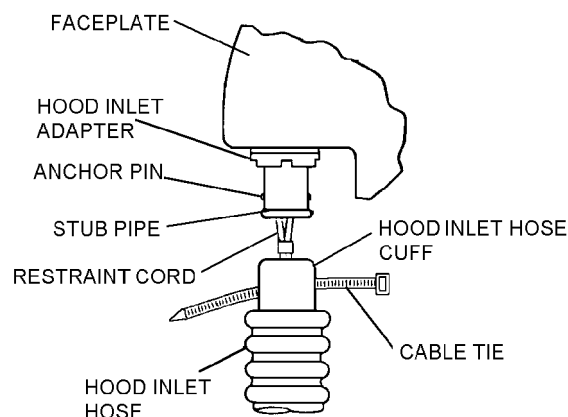
9. Engage cuff of hood inlet hose over stub pipe of the hood inlet adapter, then push cuff down for full engagement.

10. Rotate cuff around stub pipe to assure an even spread of sealing varnish over inner surface of cuff.

11. Remove any excess sealing varnish using clean, dry absorbent cloth.

12. Ensure hood inlet hose is straight and free of twists.

13. Position a 4.8 mm cable tie to attach the hood inlet hose to hood inlet adapter such that locking head is facing to left rear end of connector.



3p191s7

Steps 7 thru 13 - Para 3-191

14. Set cable tie tool (MS90387-1) to its STD (No. 7) setting, then tension cable tie to secure hood inlet hose connection to hood inlet adapter. Remove and discard excess portion of cable tie.

3-192. Mask Inlet Adapter Installation.

1. Install a new O-ring (P/N 1500956) within mounting flange on the mask inlet adapter.

2. Insert mask inlet adapter through faceplate port.

3. Invert hood to expose inside of faceplate.

4. Insert backplate over mask inlet adapter stub pipe, assuring backplate, faceplate, and mounting flange screw holes are aligned.

5. Return hood to normal position.

6. Apply a thin, even coat of sealing compound to threaded portion of two securing screws.

7. Thread the screws through holes in mask inlet mounting flange and faceplate to engage backplate.



Do not overtighten. Overtightening screws will crack polycarbonate faceplate.

8. Ensure sealing O-ring is correctly positioned to seal mask inlet adapter to faceplate, then tighten screws with torque wrench set to 40-42 oz. in.

9. Remove any excess sealing compound using a clean, dry absorbent cloth.

10. If orinasal mask was not removed, proceed with [step 14](#). If orinasal mask was removed, proceed with [step 11](#).

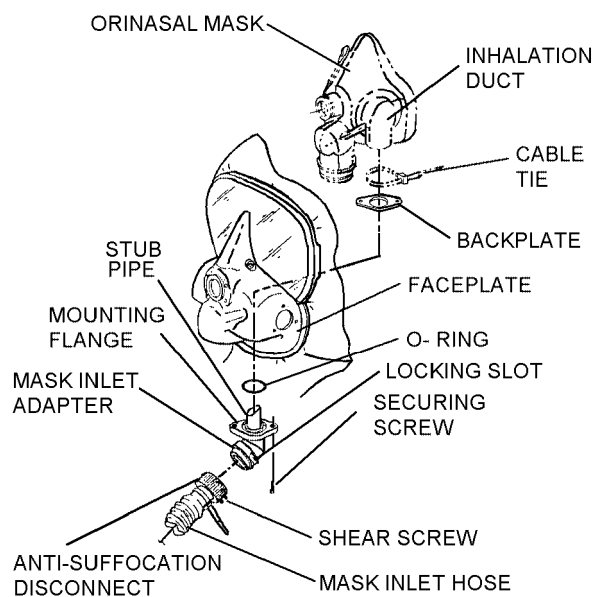
11. Ensure orinasal mask is centered within faceplate, then engage orinasal mask inhalation duct over mask inlet adapter; ensure a firm fit.

12. Clamp orinasal mask inhalation duct to mask inlet adapter stub pipe using a 3.6 mm cable tie with locking head positioned between orinasal mask and faceplate, on the inhalation duct.

13. Using a cable tie tool preset to its INT tension setting, secure inhalation duct to mask inlet adapter stub pipe. Remove and discard excess portion of cable tie.

14. Connect anti-suffocation disconnect to mask inlet adapter, taking care to assure the mask inlet hose is not twisted.

15. Install shear screw (brass) to lock anti-suffocation disconnect.



Steps 1 thru 15 - Para 3-192

3p192s1

3-193. Mask Inlet Hose/Anti-Suffocation Disconnect Installation.

1. Feed free end of restraint cord through mask inlet hose and anti-suffocation disconnect.

2. Using a bowline knot, tie restraint cord to restraint cord pin.

3. Coat external surface of the anti-suffocation disconnect with a thin, even coat of sealing varnish.

4. Ease one end of the mask inlet hose cuff onto manifold outlet, and other cuff onto anti-suffocation disconnect.

5. Rotate both ends of mask inlet hose around their respective connections to ensure an even spread of varnish.

6. Fully seat the mask inlet hose connections, then adjust to lie without kinks.

7. Position a 21.9 mm stepless low profile clamp to secure mask inlet hose to manifold outlet. Position locking head toward the wearer.

8. Using a low profile pincer tool, secure stepless low profile clamp in place.

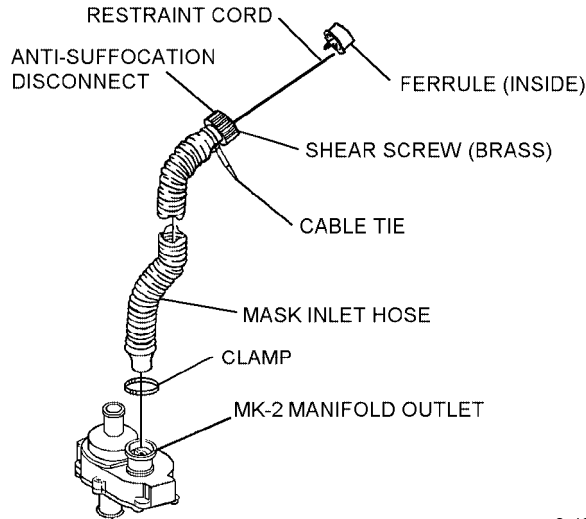
9. Position a 4.8 mm cable tie to secure mask inlet hose to anti-suffocation disconnect. Position locking head toward wearer.

10. Install cable tie into place using cable tie tool, preset to the STD No. 7 tension setting. Remove and discard excess portion of cable tie.

11. Center the ferrule within the anti-suffocation disconnect, then connect mask inlet hose to mask inlet adapter, taking care to assure mask inlet hose is not twisted.

12. Install the shear screw (brass) to lock anti-suffocation disconnect.

13. Apply a slight clockwise, then counterclockwise twist to the anti-suffocation disconnect to ensure the shear screw (brass) has engaged locking slot.



Steps 1 thru 13 - Para 3-193

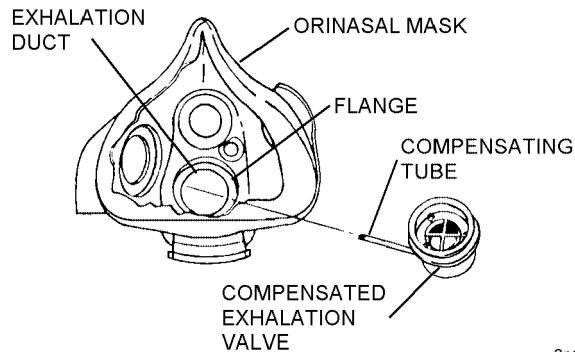
3p193s1

3-194. Compensated Exhalation Valve Installation.

NOTE

A lubricant (KRYTOX, Type II, 240 AC) should be provided to aid in this procedure. Ensure no lubricant enters hose opening.

1. Gently work valve's compensating tube into the connective passage between exhalation duct and inhalation duct. Take extreme care not to break or bend compensating tube or puncture the rubber of connective passage.

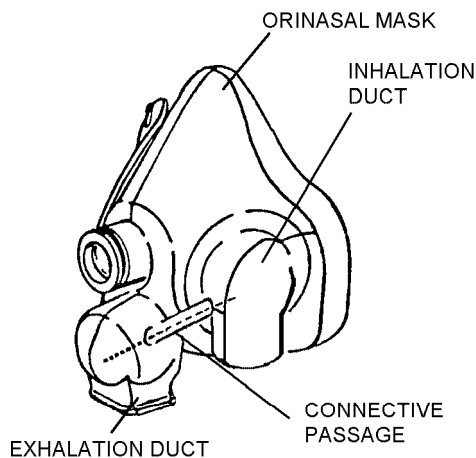


3p194s1

Step 1 - Para 3-194

2. Ensure orifice of compensating tube lies flush with orifice of inhalation duct, and is free of obstruction.

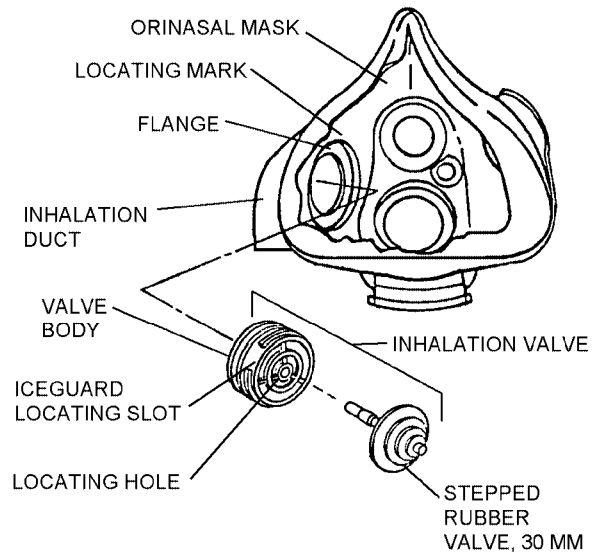
3. Install compensated exhalation valve body into flange of exhalation duct. Ensure valve body is fully engaged within flange.



3p194s2

Steps 2 and 3 - Para 3-194

3-195. Inhalation Valve Installation. Install inhalation valve to flange of inhalation duct, taking care to assure iceguard locating slots of valve holder are aligned at 90° to molded locating mark on interior of orinasal mask.



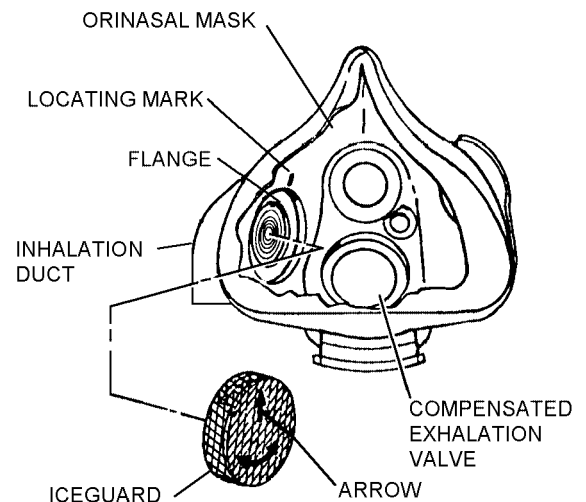
3p195

Para 3-195

3-196. Iceguard Installation.

1. Align arrow engraved on iceguard body with locating mark molded on orinasal mask interior.

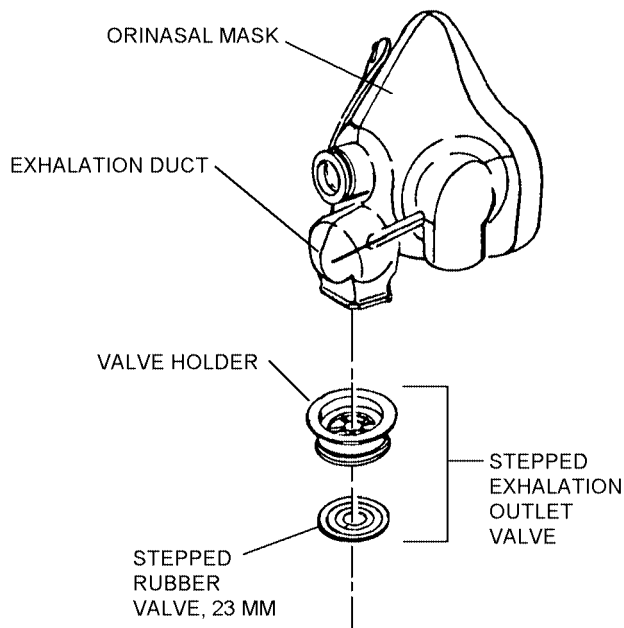
2. Apply a light pressure to iceguard and engage lugs into slots in the inhalation valve holder, then rotate iceguard clockwise 90°. When iceguard is installed correctly, engraved arrow points towards the compensated exhalation valve.



3p196s1

Steps 1 and 2 - Para 3-196

3-197. Exhalation Outlet Valve Installation. Using an elastrator, spread mask exhalation duct. Install assembled stepped exhalation outlet valve into exhalation duct, ensuring an even fit of valve holder within duct.



Para 3-197

3p197

3-198. Drink Facility Installation.

NOTE

Orinasal mask must be removed before installing drink facility.

1. Invert hood to expose orinasal mask, but do not cover faceplate.

2. Place external sealing washer (P/N 3297AS401-7) over threaded end of drink tube inlet (P/N 3297AS401-3) orienting it so edges align with edges of drink tube inlet.

3. Insert threaded end of drink tube inlet through faceplate.

4. Install internal sealing (rubber) washer (P/N 3297AS401-6), followed by the flat (metal) washer (P/N AN960-XC10L), over threaded end of drink tube inlet.



To avoid damaging faceplate, do not over-tighten spacer.

5. Carefully attach threaded spacer (P/N 3297AS401-1) onto drink tube inlet so hexagon shaped face of spacer is oriented toward inlet surface of faceplate. Tighten threaded spacer using a torque wrench set to 8.5 - 9.2 lb. in., while ensuring that the concave edges of external sealing washer and inlet base fit correctly between raised ridge of orinasal mask cavity.

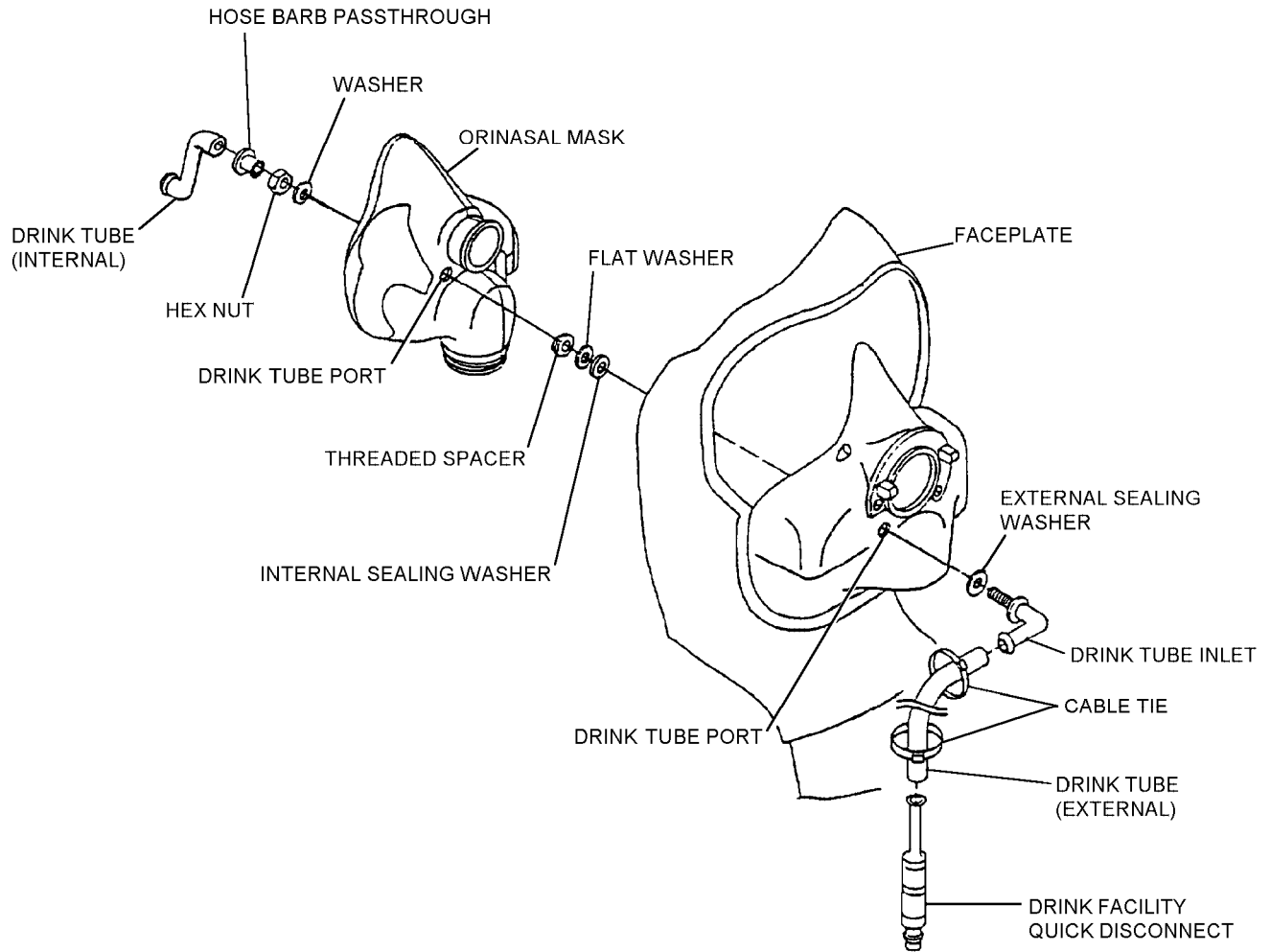
6. Carefully manipulate orinasal mask to insert threaded end of drink tube inlet into hole located immediately above and to the right of compensated exhalation valve. Ensure microphone cavity extends through faceplate.

7. Place (metal) washer (P/N AN960-XC10L) over threaded end of drink tube inlet, followed by the nut. Continue threading hex nut (P/N MS35649-204B) onto inlet until enough threads are exposed to allow threading hose barb (P/N 3297AS401-4) onto inlet.

8. Thread hose barb pass through onto drink tube inlet, with the hexagon-shaped face toward hex nut, until it makes contact with hex nut. Align edges so 3/8-inch nut driver will engage both at the same time.

9. Using 3/8-inch nut driver, tighten hex nut and hose barb until the edge of compensated exhalation valve cavity begins to distort.

10. Place internal drink tube over hose barb, positioning barbed end over compensated exhalation valve.



Steps 1 thru 10 - Para 3-198

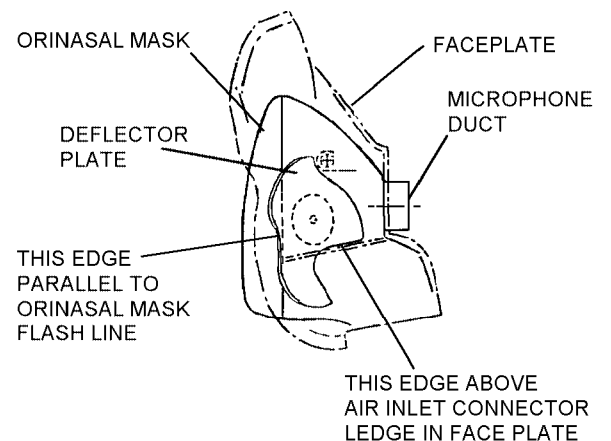
3p198s1

11. Perform mask assembly overall leakage test in accordance with [paragraph 3-122](#).

3-199. Orinasal Mask Installation.

1. Insert orinasal mask deflector plate into orinasal mask as shown. The lower straight edge of deflector plate should be parallel to edge above air inlet connector ledge in faceplate and should not strike the ledge.

2. Ensure proper positioning of deflector plate on orinasal mask.



Steps 1 and 2 - Para 3-199

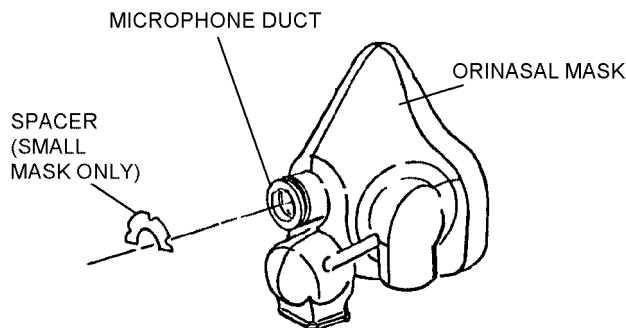
3p199s1

3. Ensure all component parts are installed on orinatal mask in accordance with paragraphs 3-194 through 3-197.



Spacer must be inserted between small orinatal mask microphone duct and inside of faceplate prior to orinatal mask installation.

4. For small-size orinatal mask (Q designation) only, invert hood and position black spacer inside faceplate. Align notches in spacer with nuts securing toggle harness assembly to inner surface of faceplate.



Step 4 - Para 3-199

3p199s4

5. With hood remaining inverted, place orinatal mask into faceplate by easing flange of microphone duct and that of exhalation duct through their respective faceplate ports. For small orinatal mask, ensure spacer remains in proper location.

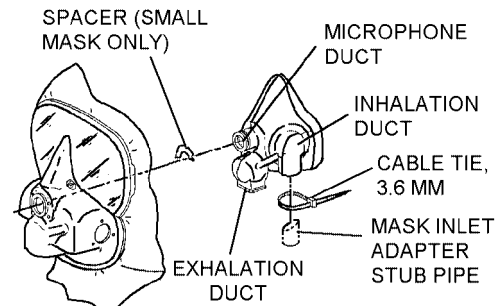
6. Center orinatal mask within faceplate, then engage the inhalation duct over mask inlet adapter stub pipe, ensuring a firm fit. Ensure threaded portion of drink tube assembly passes through grommet in orinatal mask.

7. Clamp inhalation duct to mask inlet adapter stub pipe, using a 3.6 mm cable tie (CL 6226) with locking head positioned between left-hand side of mask inlet adapter and faceplate.

8. Using a cable tie tool preset to its INT (No. 4) tension setting, secure inhalation duct to mask inlet adapter, stub pipe. Remove and discard excess portion of cable tie.

9. If not already done, apply a thin, even coat of thread locking compound to threaded portion of drink

tube assembly, then fit and tighten locknut using a torque wrench set to 11.5-12.5 in.-lb.



3p199s5

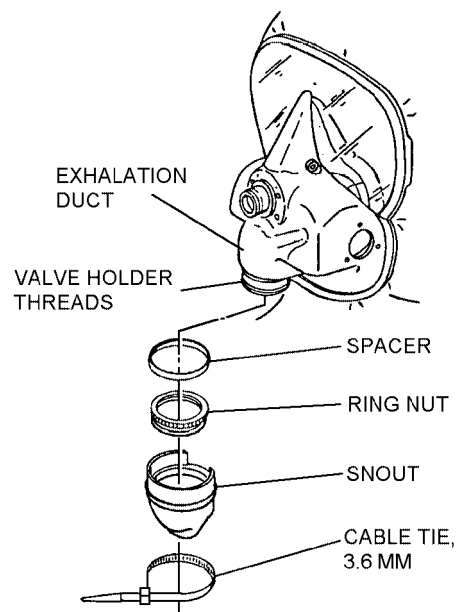
Steps 5 thru 9 - Para 3-199

3-200. Snout Installation.

1. Ease lip of exhalation duct through port of faceplate, ensuring valve is not disturbed within duct, then install spacer.

2. Screw ring nut to threaded portion of valve holder (knurled ring facing up), sealing orinatal mask rubber to faceplate.

3. Install snout over ring nut and position a 3.6 mm cable tie (CL 6226) with locking head located to right of snout. Install with cable tie tool set to INT (No. 4) position. Remove excess portion of cable tie.

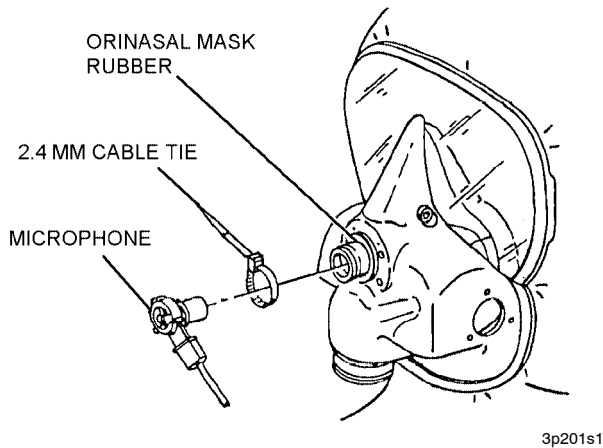


3p200s1

Steps 1 thru 3 - Para 3-200

3-201. Microphone Installation.

1. Push microphone into orinasal mask rubber duct, taking care not to push orinasal mask rubber back into faceplate port.
2. Position a 2.4 mm cable tie around orinasal mask rubber with locking head of cable tie located to the lower right of microphone.
3. Using a cable tie tool preset to the INT tension position, clamp orinasal mask rubber to microphone.
4. Remove and discard excess portion of cable tie.

**Steps 1 thru 4 - Para 3-201****3-202. Blanking Plug - Nose Occluder Faceplate Bushing Installation.**

1. Insert blanking plug in nose occluder bushing from outside of mask.
2. Press blanking plug fully into bushing. Ensure plug rim contacts bushing.
3. Invert hood and ensure lip on end of plug protrudes past end of nose occluder bushing on inner surface of faceplate.
4. Perform Mask Assembly Overall Leakage Test.

3-203. LOWER ASSEMBLY.**3-204. Pusher Fan Subassembly Installation.****3-205. Manifold Hose to MK-2 Manifold Assembly.****WARNING**

To prevent contamination of inner surfaces, do not apply adhesive within 1/4 inch from end of manifold port.

1. Install a new 28.6 mm stepless low profile clamp (P/N 3297AS201-3) over 3/4 inch end of manifold hose.

2. Install 3/4-inch end of manifold hose on MK-2 manifold inlet port.

3. Using low profile pincer, secure clamp in place around hose approximately 1/2 inch from end of hose. Ensure connection is tight.

3-206. Manifold Hose to J-Manifold and Gasket Installation.**WARNING**

To prevent contamination of inner surfaces, do not apply adhesive within 1/4 inch from end of manifold port.

1. Install a new 28.6 mm stepless low profile clamp (P/N 3297AS201-3) over free end of manifold hose.

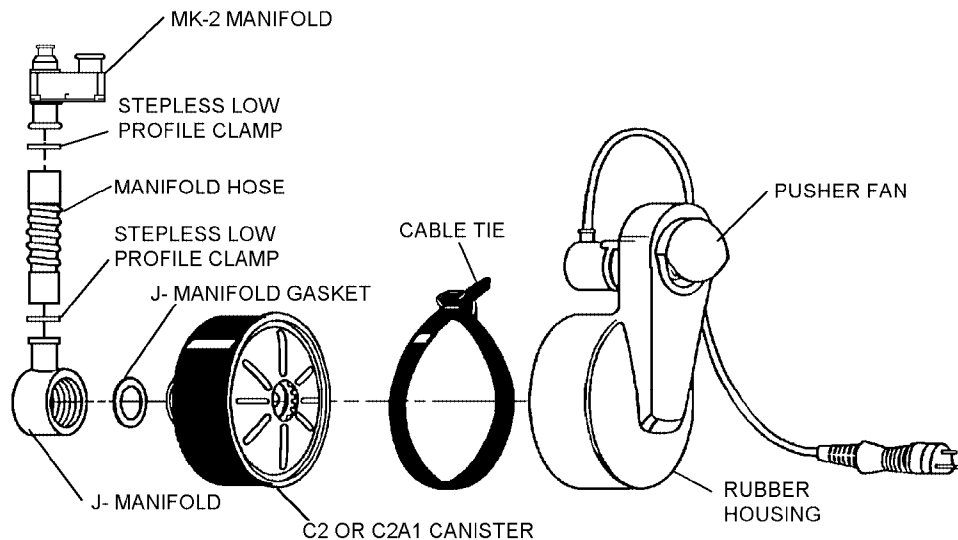
2. Insert J-manifold into 7/8-inch (larger) end of hose until hose is flush with MK-2 manifold shoulder. Ensure J-manifold is positioned with canister opening to right as shown.

3. Using low profile pincer, secure clamp in place around hose approximately 1/2 inch from end of hose. Ensure clamp is below J-manifold retention lip, tight and positioned as shown.

4. Insert J-manifold gasket. Ensure gasket is flat and properly seated.

5. Ensure all connectors are tight and positioned properly.

6. Ensure all components are aligned as shown.



Steps 1 thru 6 - Para 3-206

3p206s1

3-207. C2 or C2A1 Canister Installation (figure 3-50).

WARNING

Either C2 or C2A1 may be used. Do not use any other filter canister.

1. Inspect gasket (P/N 3297AS211-1) for proper seating in manifold.

2. Screw canister (clockwise) into J-manifold until it is in contact with gasket and fully hand tighten.

4. Using cable tie tool (NIIN 00-937-5438) preset to HVY (No. 8), install 18 inch cable tie centered around the canister and rubber housing and secure canister to pusher fan rubber housing. Ensure cable tie is tight and positioned as shown.

5. Ensure pusher fan is secured properly to C2 or C2A1 canister.

NOTE

Peel away protective latex coating, if applied to faceplate visual area.

3-208. Pusher Fan Installation (figure 3-50).

1. Ensure pusher fan has been tested according to pusher fan bench test paragraph 3-116.

2. Slide pusher fan rubber housing over canister until filler canister lip bottoms out in rubber housing. Ensure pusher fan is positioned as shown.

3. Ensure pusher fan intake port is positioned with intake port as shown.

6. Perform Calendar Inspection in accordance with paragraph 3-107.

7. Document in accordance with OPNAVINST 4790.2 Series.

3-209. Pusher Fan Battery Installation. Plug pusher fan cord into the battery pack. Be careful when inserting plug so as not to break off any of the prongs. Be sure plug bottoms out in battery socket.

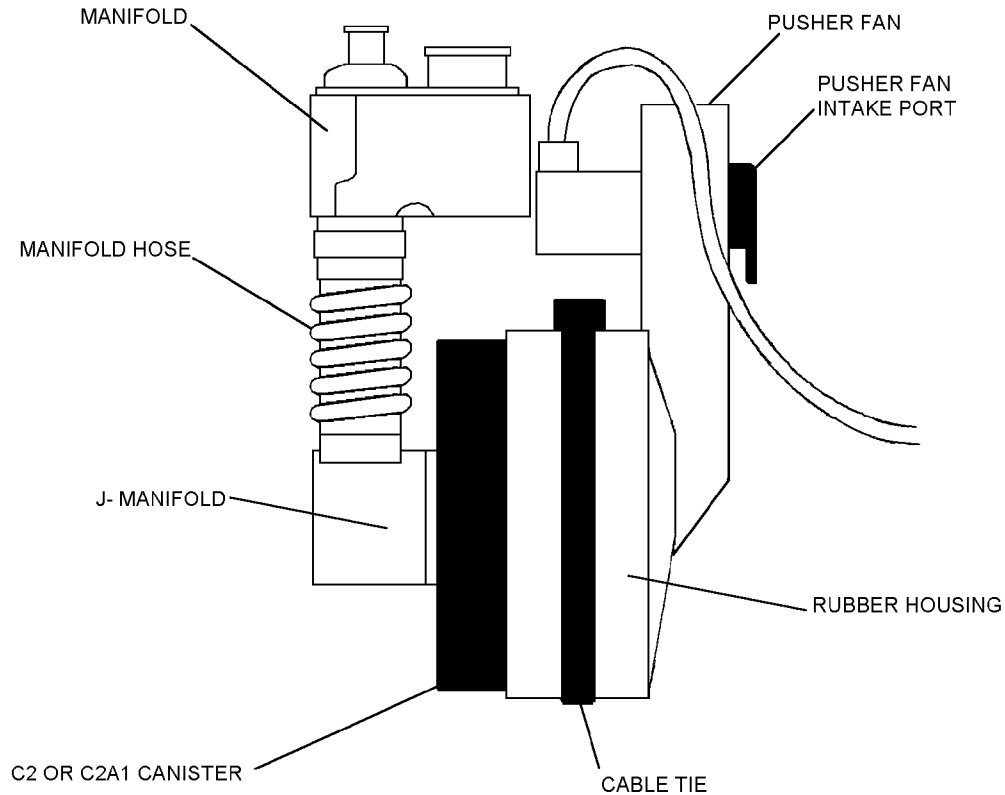


Figure 3-50. Installation of C2 or C2A1 Canister and Pusher Fan

003050

Section 3-5. Illustrated Parts Breakdown

3-210. GENERAL.

3-211. This section lists and illustrates only replaceable components of the respirator assemblies. The IPB is intended for use in identification, procurement and the issuance of replacement components. It also illustrates the necessary disassembly and assembly relationships. Installation, operation, and maintenance of the respirator assemblies shall be performed only by authorized personnel using the instructions set forth in the preceding sections. Source, Maintenance and Recoverability codes are provided for procurable items.

CAUTION

Only parts listed in the IPB are authorized to be procured at this time.

NOTE

For more complete information on the IPB, Group Assembly Parts List and SM&R Code, refer to [Chapter 2, Section 2-4](#), NAVSUPINST 4423.29, OPNAVINST 4410.2A, and NAVSUP P-719.

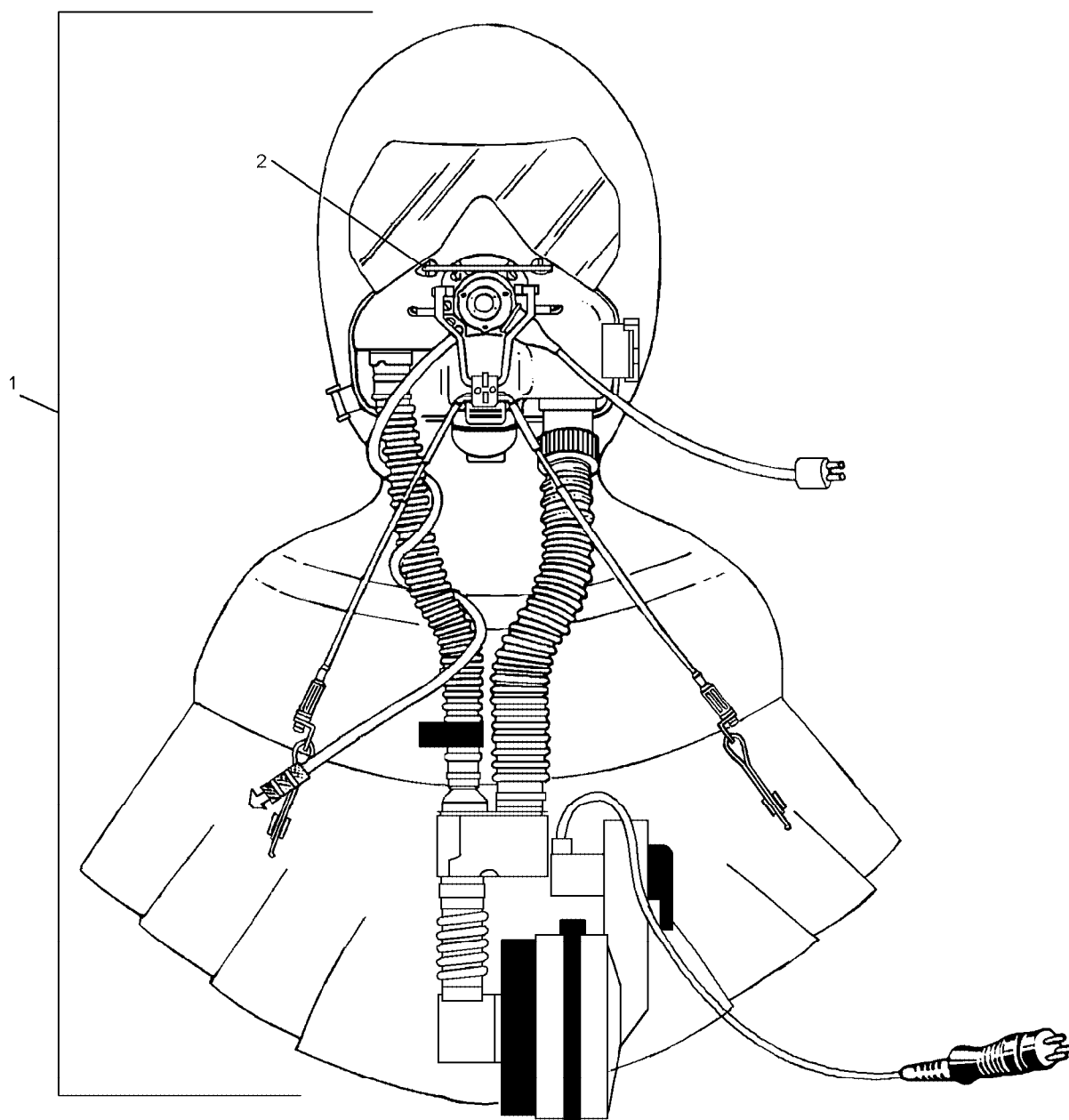


Figure 3-51. Respirator Assembly (Nose Occluder Identified)

3-51

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
3-51-1	3297AS250-1	RESPIRATOR ASSEMBLY STANDARD HOOD (P MASK)	REF	
	3297AS250-3	RESPIRATOR ASSEMBLY EXTRA LARGE HOOD (P MASK)	1	
	3297AS250-4	RESPIRATOR ASSEMBLY STANDARD HOOD (Q MASK)	1	
	3297AS250-5	RESPIRATOR ASSEMBLY EXTRA SMALL HOOD (Q MASK)	1	
-2	1501010	OCCLUDER, NOSE 4 MM LONG	1	
	1501011	OCCLUDER, NOSE 5 MM LONG	1	
	1501012	OCCLUDER, NOSE 6 MM LONG	1	
	1501013	OCCLUDER, NOSE 7 MM LONG	1	
	1501014	OCCLUDER, NOSE 4 MM SHORT	1	
	1501015	OCCLUDER, NOSE 5 MM SHORT	1	
	1501016	OCCLUDER, NOSE 6 MM SHORT	1	
	1501017	OCCLUDER, NOSE 7 MM SHORT	1	

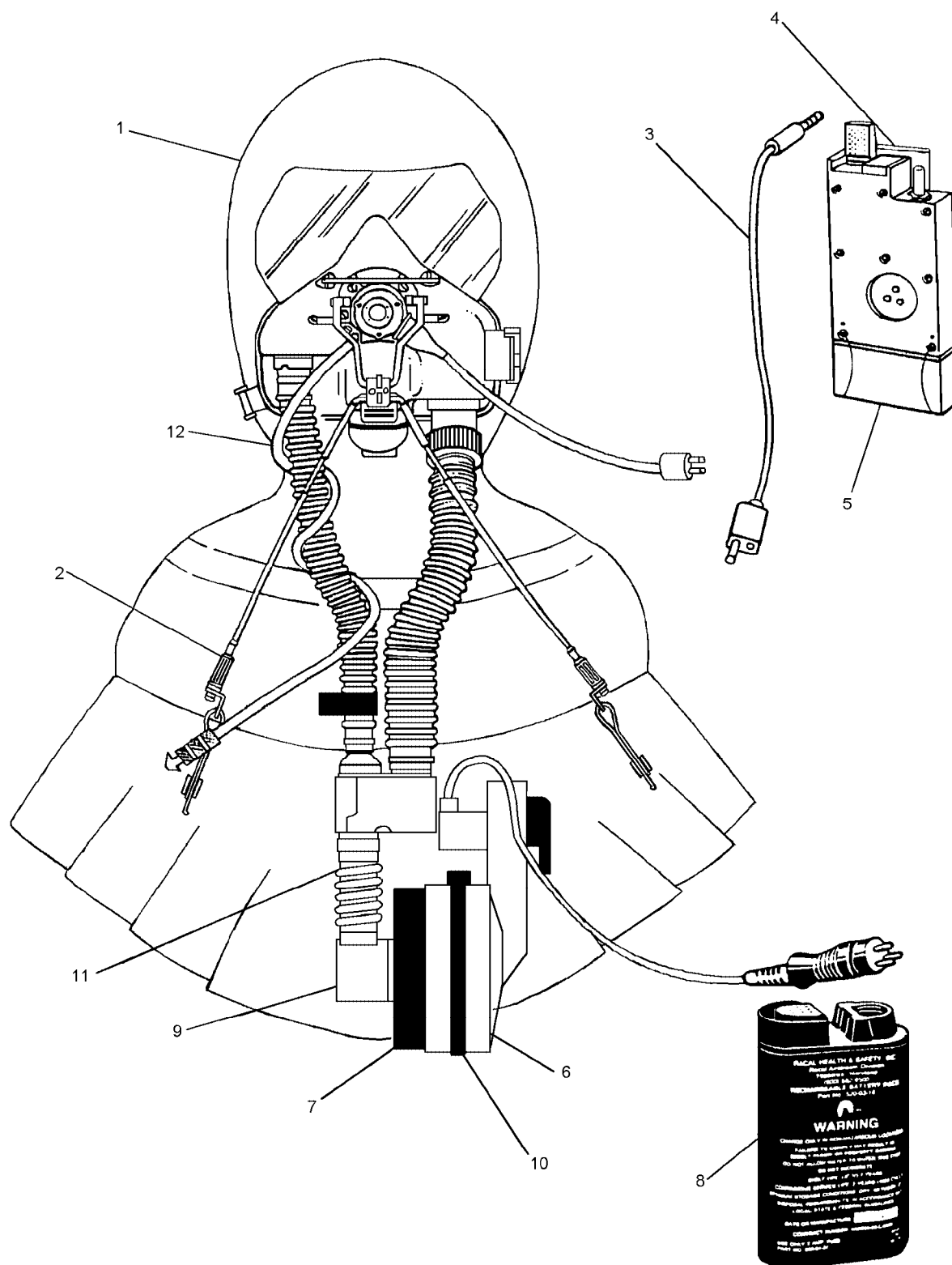


Figure 3-52. Respirator Assembly (Major Components Identified)

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
3-52	3297AS250-1	RESPIRATOR ASSEMBLY STANDARD							REF	A
		HOOD (P MASK)								
	3297AS250-3	RESPIRATOR ASSEMBLY EXTRA LARGE							REF	C
		HOOD (P MASK)								
	3297AS250-4	RESPIRATOR ASSEMBLY STANDARD							REF	D
		HOOD (Q MASK)								
	3297AS250-5	RESPIRATOR ASSEMBLY EXTRA SMALL							REF	E
		HOOD (Q MASK)								
	-1 608916	. MASK MCK-3A/P STANDARD HOOD							1	A
		(P MASK)								
	608918	. MASK MCK-3A/P EXTRA LARGE HOOD							1	C
		(P MASK)								
	608919	. MASK MCK-3A/P STANDARD HOOD							1	D
		(Q MASK)								
	608920	. MASK MCK-3A/P EXTRA SMALL HOOD							1	E
		(Q MASK)								
	-2 1503332	. WIRE TOGGLE HARNESS ASSEMBLY							1	
	-3 1505068	. COMMUNICATION CABLE							1	
	-4 1507926	. INTERCOM SET A/P37S-1							1	
		(REPLACES 1505060)								
-5	—	. . 9V BATTERY & HOUSING							1	
-6	3297AS600-1	. PUSHER FAN							1	
-7	DS-3-1520	. C2A1 CANISTER (NOTE 1)							1	
	DS-3-1500	. C2 CANISTER (NOTE 1)							1	
-8	3297AS601-1	. BATTERY							1	
	3297AS601-2	. BATTERY							1	
-9	3297AS210-1	. J-MANIFOLD							1	
-10	CL 6528	. CABLE TIE, 7.6 MM (18 IN)							1	
-11	3297AS203-1	. HOSE, CBR PROTECTIVE							1	
		(MANIFOLD HOSE)								
-12	3297AS401-1	. DRINK FACILITY ASSEMBLY							1	
		Notes: 1. The C2A1 Canister will replace the C2 Canister thru attrition.								

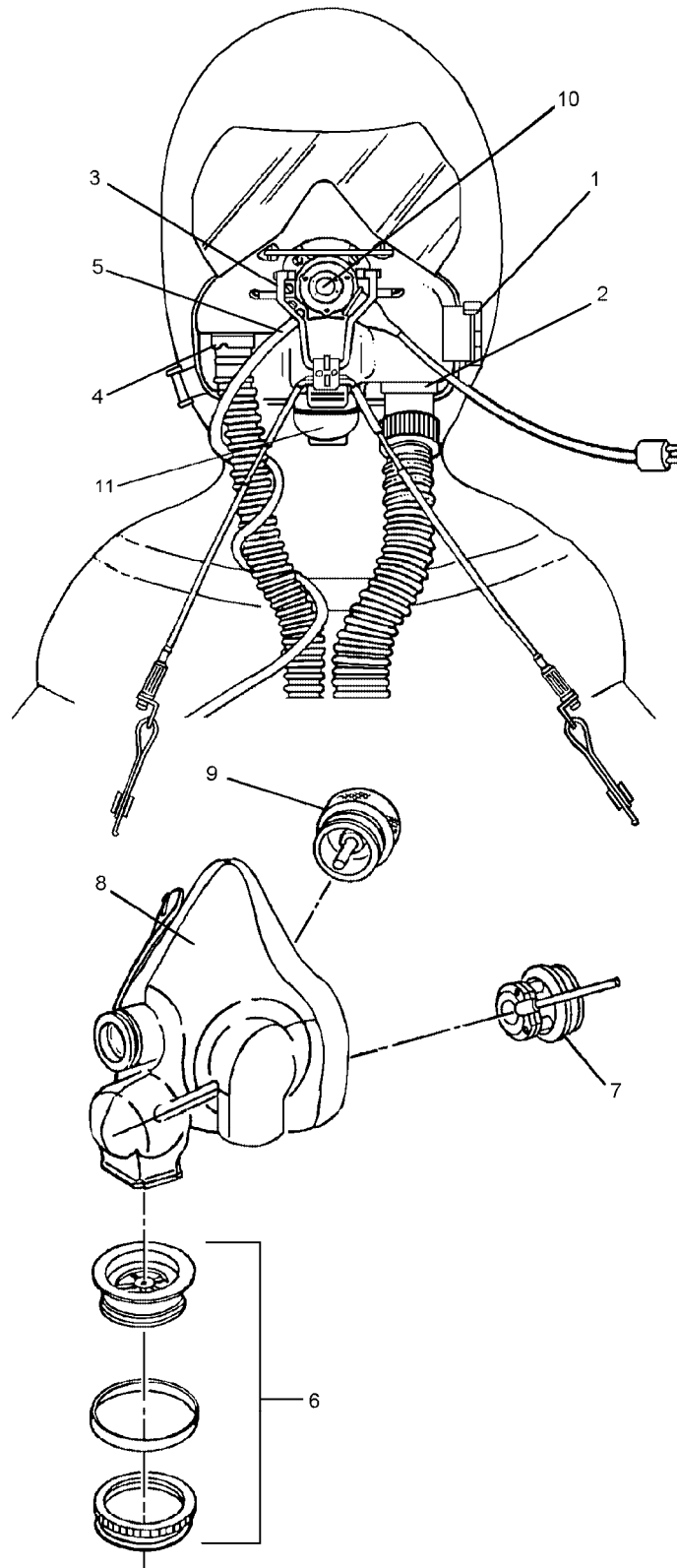
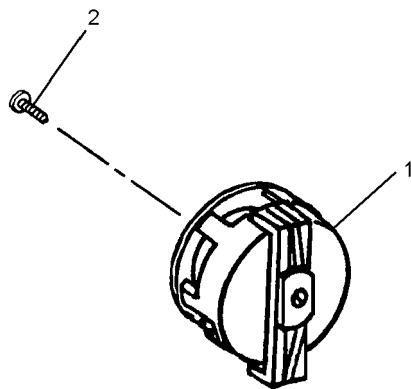


Figure 3-53. MCK-3A/P Mask Assembly

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
3-53	608016 608018 608019 608020	MCK-3A/P MASK ASSEMBLY							REF	
-1	—	.							REF	
-2	—	.							REF	
-3	—	.							REF	
-4	—	.							REF	
-5	—	.							REF	
-6	—	.							REF	
-7	—	.							REF	
-8	—	.							REF	A
	—	.							REF	B
-9	—	.							REF	
-10	—	.							REF	
-11	—	.							REF	



3-54

Figure 3-54. Hood Outlet Valve Assembly

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
3-54	—	HOOD OUTLET VALVE ASSEMBLY	REF	
-1	1505043	. VALVE, HOOD OUTLET	1	
-2	808372	. . SCREW, PAN HEAD	3	

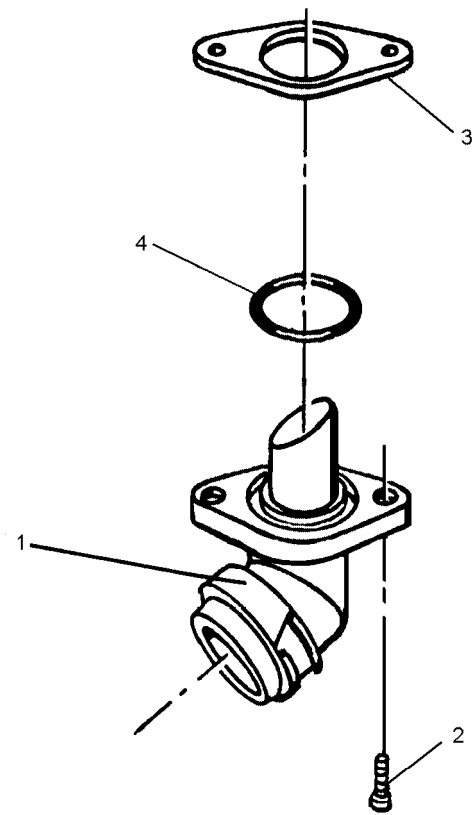
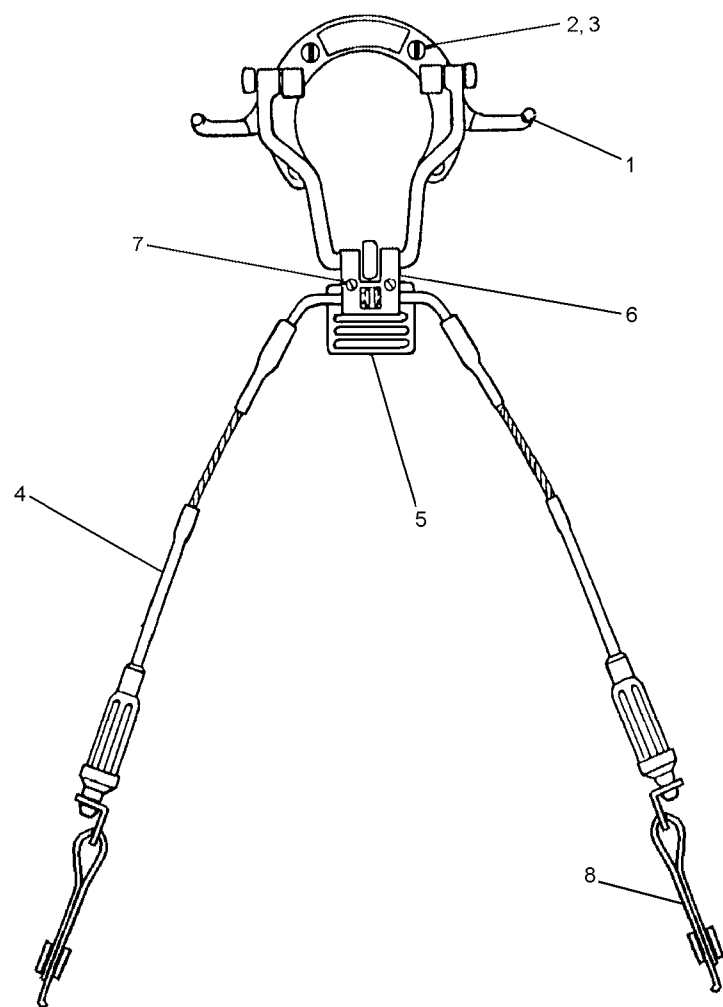


Figure 3-55. Mask Inlet Adapter Assembly

3-55

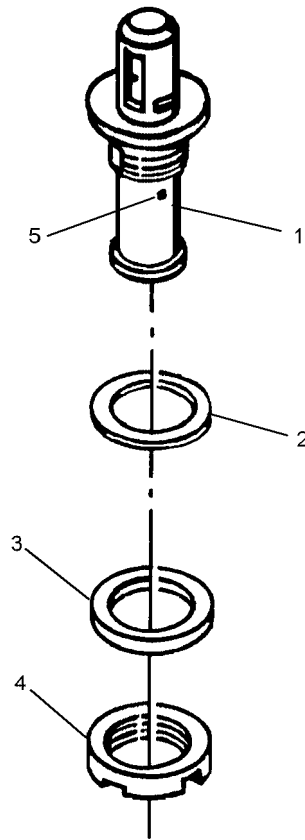
Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
3-55	—	MASK INLET ADAPTER ASSEMBLY							REF	
-1	1501091	. ADAPTER, MASK INLET							1	
-2	814478	. . SCREW, PAN HEAD							2	
-3	1500955	. . BACKPLATE							1	
-4	1500956	. . O-RING							1	



3-56

Figure 3-56. Wire Toggle Harness Assembly

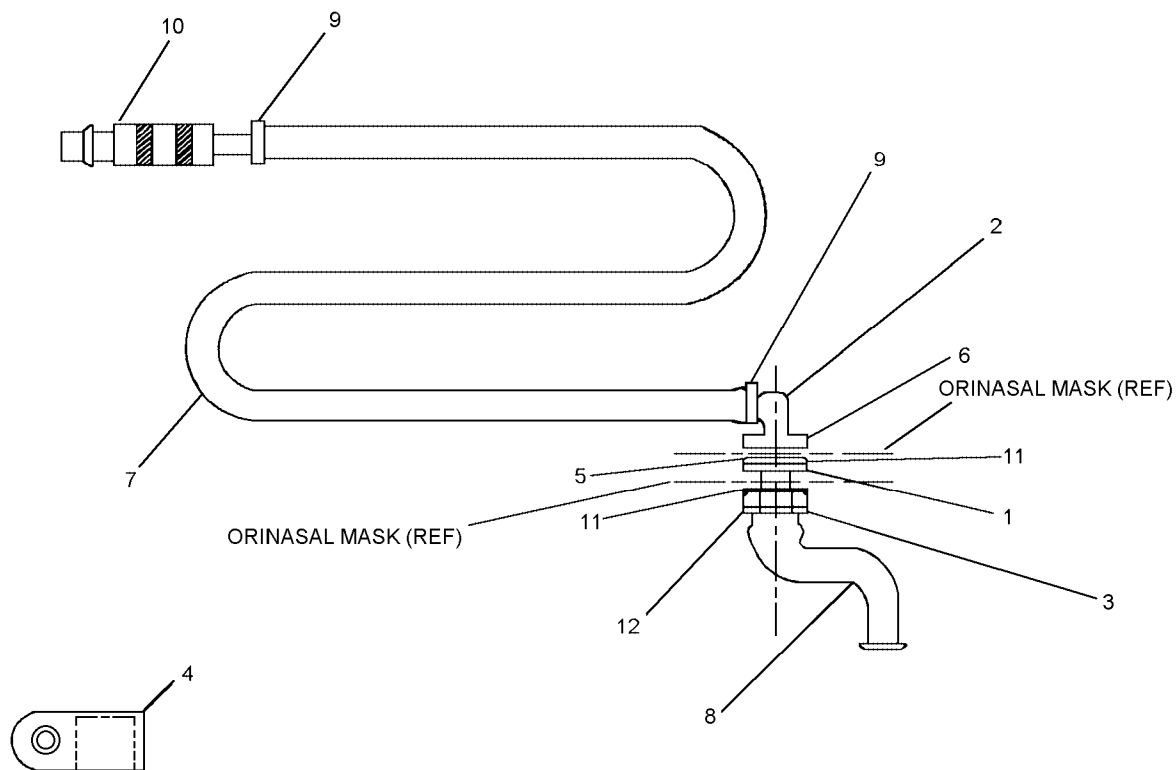
Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
3-56	1503332	WIRE TOGGLE HARNESS ASSEMBLY	REF	
-1	1503453	. HARNESS, MASK	1	
-2	—	. . SCREW, COUNTERSUNK	4	
-3	—	. . NUT	4	
-4	1505083	. CABLE ASSEMBLY	2	
	1503626	. TOGGLE PLATE KIT	1	
-5	—	. . PLATE, TOGGLE*	1	
-6	—	. . TOGGLE FIXING PLATE*	1	
-7	—	. . SCREW*	2	
-8	—	. STRAP, ADAPTER	2	
	*supplied in kit			



3-57

Figure 3-57. Hood Inlet Adapter Assembly

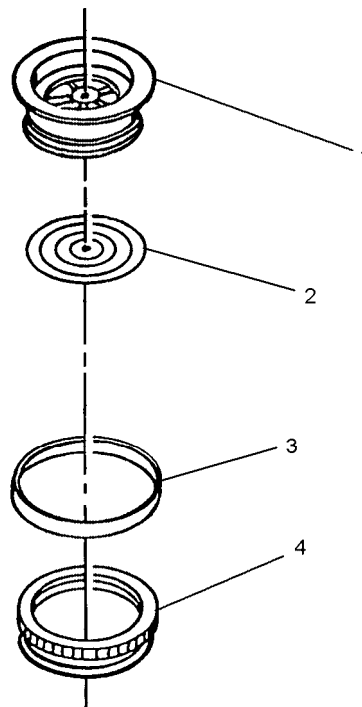
Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
3-57	—	HOOD INLET ADAPTER ASSEMBLY							REF	
-1	1500719	.	.	.	.	.	.	.	1	
-2	1500835	.	.	.	.	.	.	.	1	
-3	1500834	.	.	.	.	.	.	.	1	
-4	1500720	.	.	.	.	.	.	.	1	
-5	1500953	.	.	.	.	.	.	.	1	



3-58

Figure 3-58. Drink Facility Assembly

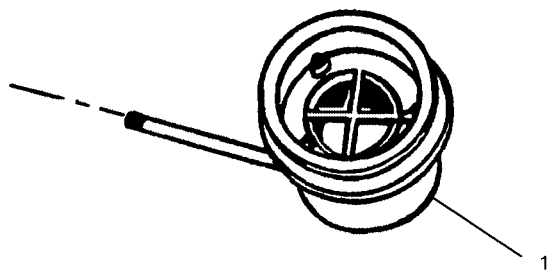
Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
3-58	3297AS401-1	DRINK FACILITY ASSEMBLY	REF	
-1	3297AS401-2	. SPACER	1	
-2	3297AS401-3	. DRINK TUBE, INLET	1	
-3	3297AS401-4	. HOSE BARB, DRINK TUBE, PASS THRU	1	
-4	3297AS401-5	. DRINK TUBE FACILITY HOLDER	1	
-5	3297AS401-6	. WASHER, INTERNAL SEALING	1	
-6	3297AS401-7	. WASHER, EXTERNAL SEALING	1	
-7	3297AS401-8	. DRINK TUBE, EXTERNAL	1	
-8	3297AS401-9	. DRINK TUBE, INTERNAL	1	
-9	CL 6225	. CABLE TIE, 2.4 MM	2	
-10	3297AS402-1	. DRINK FACILITY, QUICK DISCONNECT	1	
-11	AN960-XC10L	. WASHER, FLAT	2	
-12	MS35649-204	. NUT, PLAIN, HEXAGON	1	



3-59

Figure 3-59. Exhalation Outlet Valve Assembly

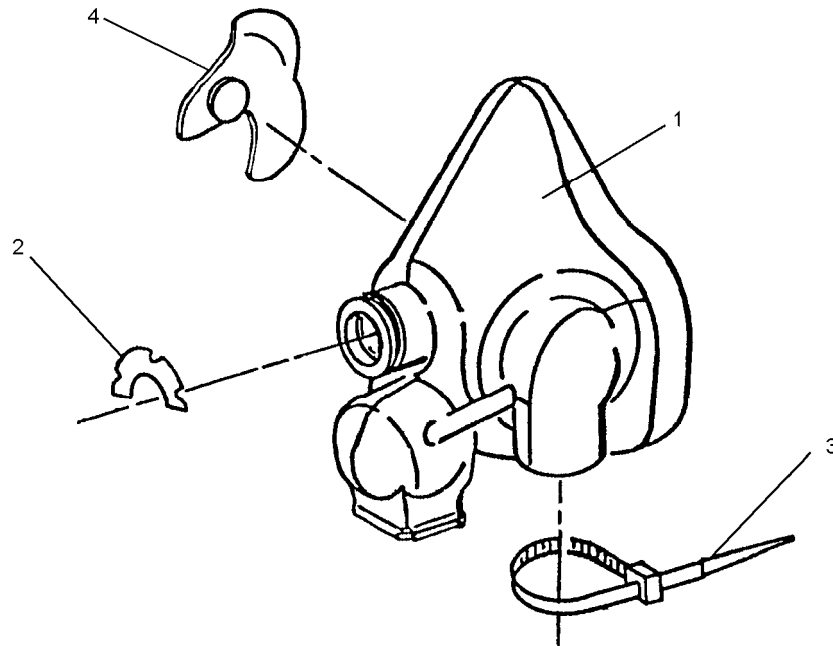
Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
3-59	—	EXHALATION OUTLET VALVE ASSEMBLY							REF	
-1	1503232	. VALVE, EXHALATION OUTLET							1	
-2	1500873	. . VALVE, STEPPED RUBBER, 23 MM							1	
-3	1503233	. RING, SPACER							1	
-4	1500830	. RING, LOCKING							1	



3-60

Figure 3-60. Compensated Exhalation Valve Assembly

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
3-60 -1	— 1500875	COMPENSATED EXHALATION VALVE VALVE, COMPENSATED EXHALATION							REF 1	



3-61

Figure 3-61. Orinasal Mask Assembly

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
3-61	—	ORINASAL MASK ASSEMBLY, LARGE (P)							REF	A
	—	ORINASAL MASK ASSEMBLY, SMALL (Q)							REF	B
-1	818538	.							1	A
	818539	.							1	B
-2	1503334	.							1	B
-3	CL 6226	.							1	
-4	1500840	.							1	

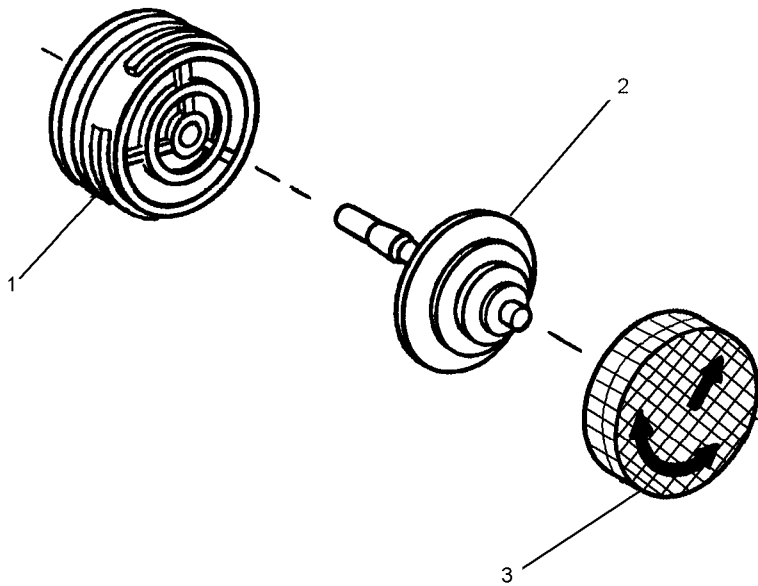


Figure 3-62. Inhalation Valve Assembly

3-62

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
3-62	—	INHALATION VALVE ASSEMBLY							REF	
-1	1500939	. VALVE, BODY							1	
-2	1500937	. . VALVE, STEPPED RUBBER, 30 MM							1	
-3	6089075	. . ICEGUARD							1	

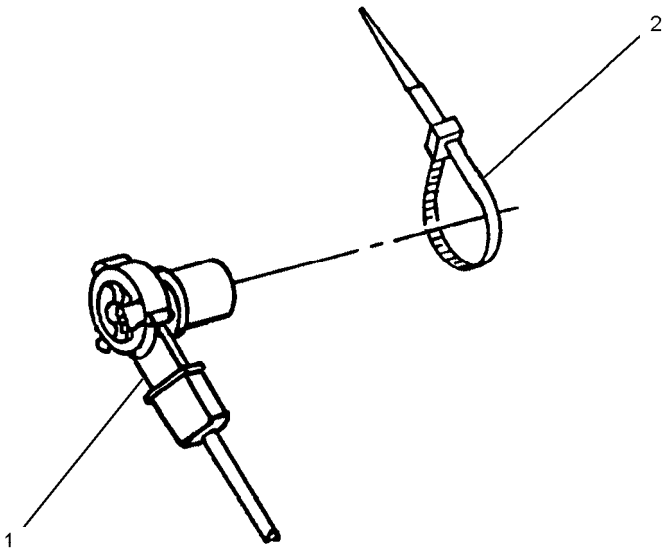


Figure 3-63. Microphone Assembly

3-63

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
3-63	—	MICROPHONE ASSEMBLY	REF	
-1	1503344	. MICROPHONE	1	
-2	CL 6225	. CABLE TIE, 2.4 MM	1	

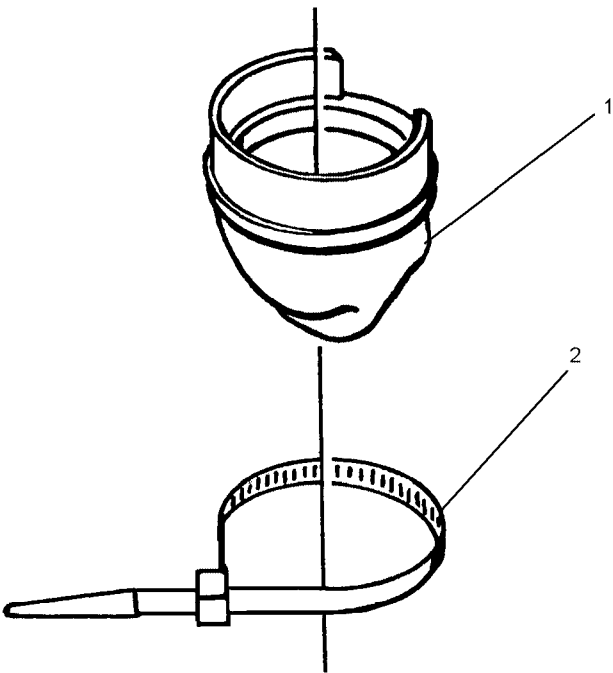


Figure 3-64. Snout Assembly

3-64

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
3-64	—	SNOUT ASSEMBLY							REF	
-1	1500831	. SNOUT							1	
-2	CL 6226	. CABLE TIE, 3.6 MM							1	

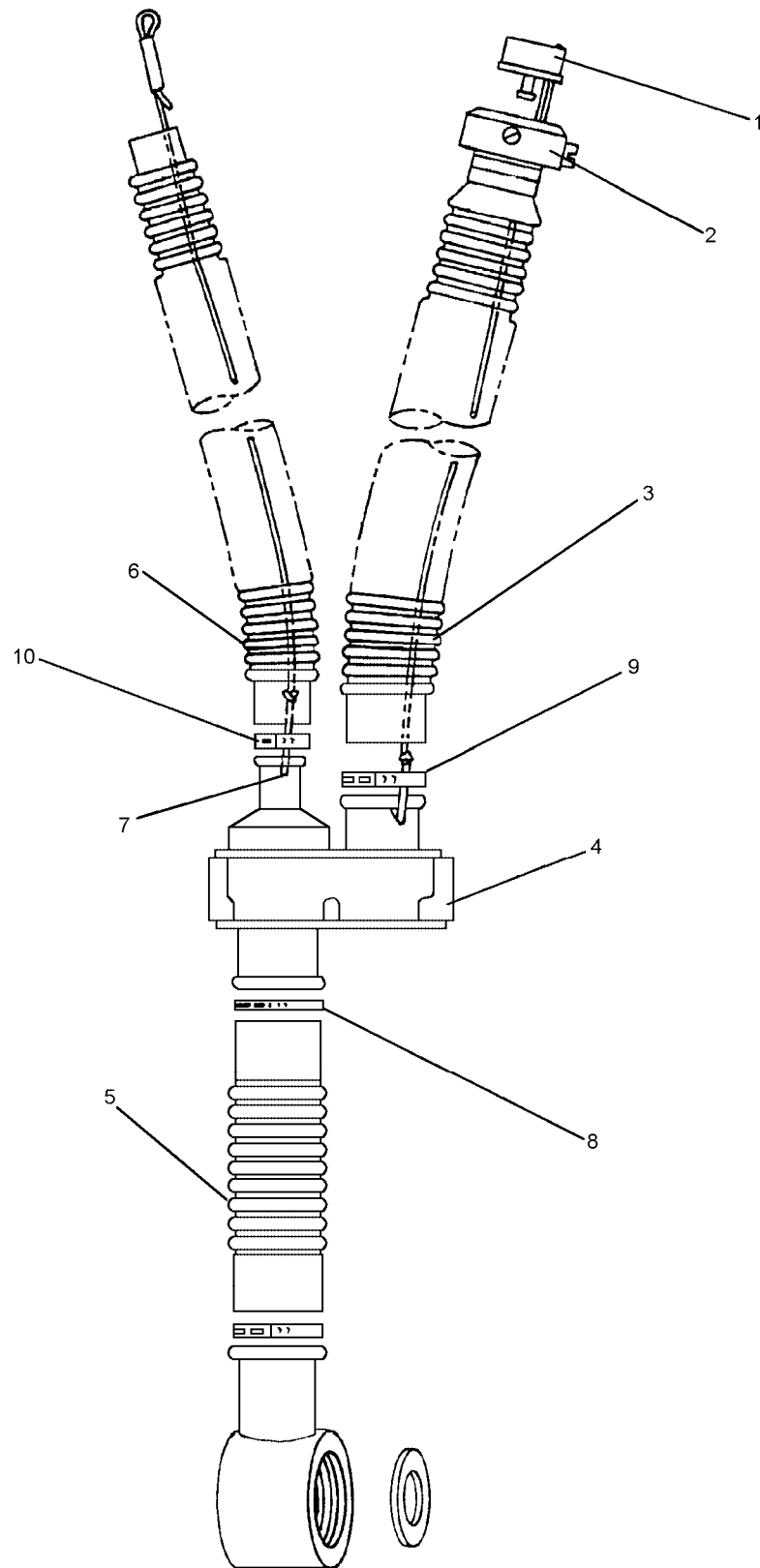
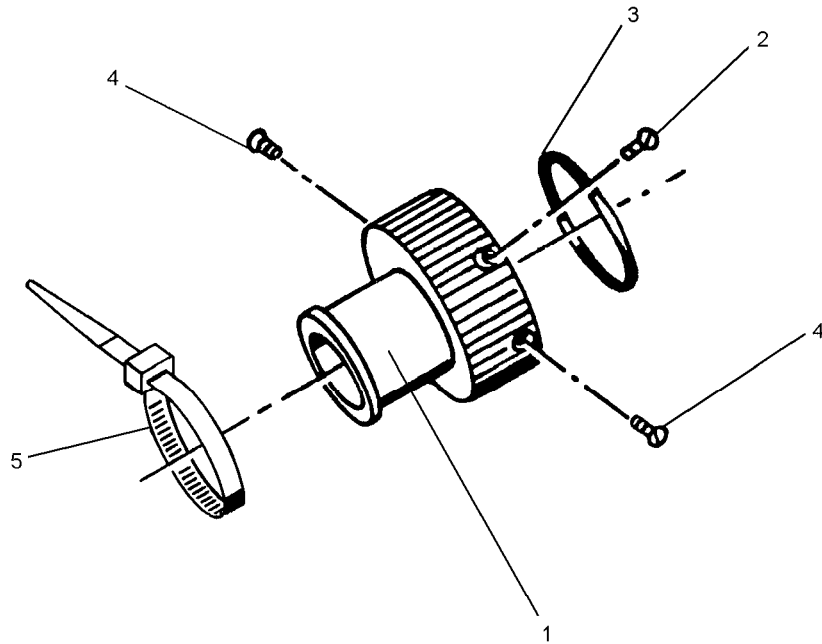


Figure 3-65. MK-2 Manifold Assembly and Associated Components

3-65

NAVAIR 13-1-6.10

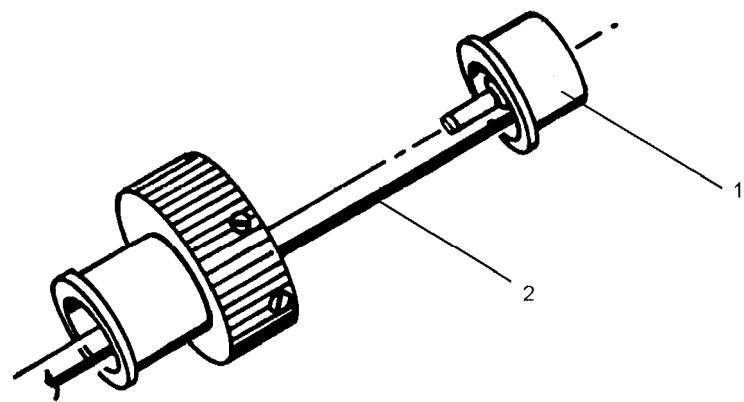
Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
3-65	6089058	MANIFOLD ASSEMBLY, MK-2 (REPLACES 1502519)	REF	
-1	—	. ANTI-SUFFOCATION DISCONNECT ASSEMBLY (FIGURE 3-66)	REF	
-2	—	. FERRULE ASSEMBLY (FIGURE 3-67)	REF	
-3	—	. MASK INLET HOSE ASSEMBLY (FIGURE 3-68)	REF	
-4	6089126	. MANIFOLD	1	
	1500872	. . VALVE, HOOD INLET, STEPPED RUBBER, 18 MM	1	
-5	3297AS203-1	. HOSE, CBR PROTECTIVE (MANIFOLD HOSE)	REF	
-6	—	. HOOD INLET HOSE ASSEMBLY (FIGURE 3-69)	REF	
-7	1500953	. PIN, HOOD RESTRAINT CORD	1	
-8	3297AS201-3	. STEPLESS LOW PROFILE CLAMP, 28.6 MM ..	2	
-9	CL 6593	. STEPLESS LOW PROFILE CLAMP, 21.9 MM ..	1	
-10	CL 6592	. STEPLESS LOW PROFILE CLAMP, 16.5 MM ..	1	



3-66

Figure 3-66. Anti-Suffocation Disconnect Assembly

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
3-66	—	ANTI-SUFFOCATION DISCONNECT ASSEMBLY							REF	
-1	1505121	.							1	
-2	1505075	.							1	
-3	6089125	.	.						1	
-4	—	.	.						2	
-5	CL 6227	.	.						1	



3-67

Figure 3-67. Ferrule Assembly

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
3-67	—	FERRULE ASSEMBLY							REF	
-1	1505123	. FERRULE							1	
-2	6089128	. CORD, MASK RESTRAINT							1	

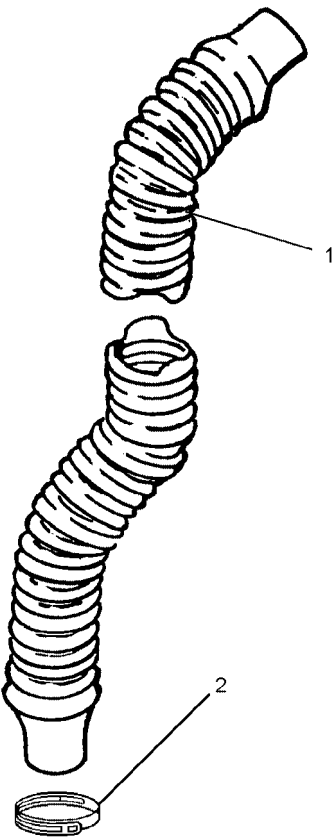


Figure 3-68. Mask Inlet Hose Assembly

3-68

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
3-68	—	MASK INLET HOSE ASSEMBLY	REF	
-1	1505122	. HOSE, 5/8 IN. CORRUGATED	1	
-2	CL 6593	. STEPLESS LOW PROFILE CLAMP, 21.9 MM ..	1	

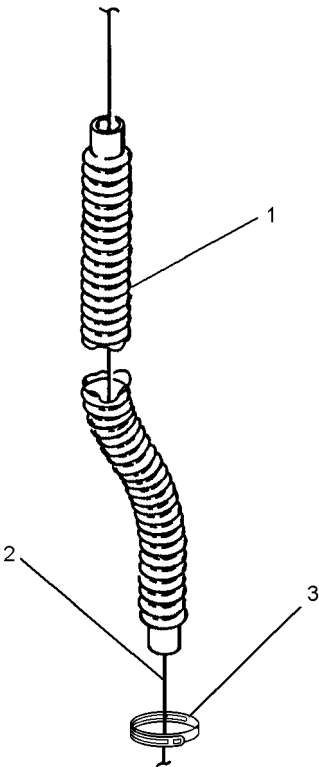


Figure 3-69. Hood Inlet Hose Assembly

3-69

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
3-69	—	HOOD INLET HOSE							REF	
-1	6089068	.							1	
-2	1505126	.							1	
-3	CL 6592	.							1	

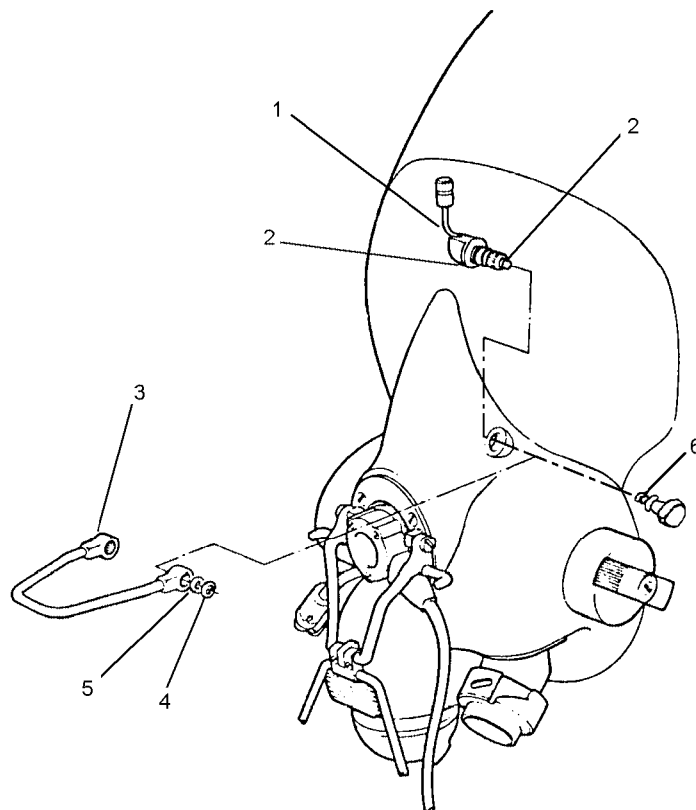


Figure 3-70. Nose Occluder Assembly

NAVAIR 13-1-6.10

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
3-70	1501010	OCCLUDER, NOSE, 4 MM LONG	REF	
	1501011	OCCLUDER, NOSE, 5 MM LONG	REF	
	1501012	OCCLUDER, NOSE, 6 MM LONG	REF	
	1501013	OCCLUDER, NOSE, 7 MM LONG	REF	
	1501014	OCCLUDER, NOSE, 4 MM SHORT	REF	
	1501015	OCCLUDER, NOSE, 5 MM SHORT	REF	
	1501016	OCCLUDER, NOSE, 6 MM SHORT	REF	
	1501017	OCCLUDER, NOSE, 7 MM SHORT	REF	
	-1 1500985	. SHAFT ASSEMBLY	2	
	1500986	. SHAFT ASSEMBLY	2	
	1500987	. SHAFT ASSEMBLY	2	
	1500988	. SHAFT ASSEMBLY	2	
	1500989	. SHAFT ASSEMBLY	2	
	1500990	. SHAFT ASSEMBLY	2	
	1500991	. SHAFT ASSEMBLY	2	
	1500992	. SHAFT ASSEMBLY	2	
	-2 815938	. O-RING	2	
	-3 1500982	. STIRRUP ASSEMBLY	1	
	-4 1500936	. C-CLIP	2	
	-5 1501183	. WASHER, FACING	2	
	-6 CL 6131	PLUG, BLANKING (NOTE 1)	2	
	Notes : 1. Blanking plugs are to be installed when nose occluder is not installed.			

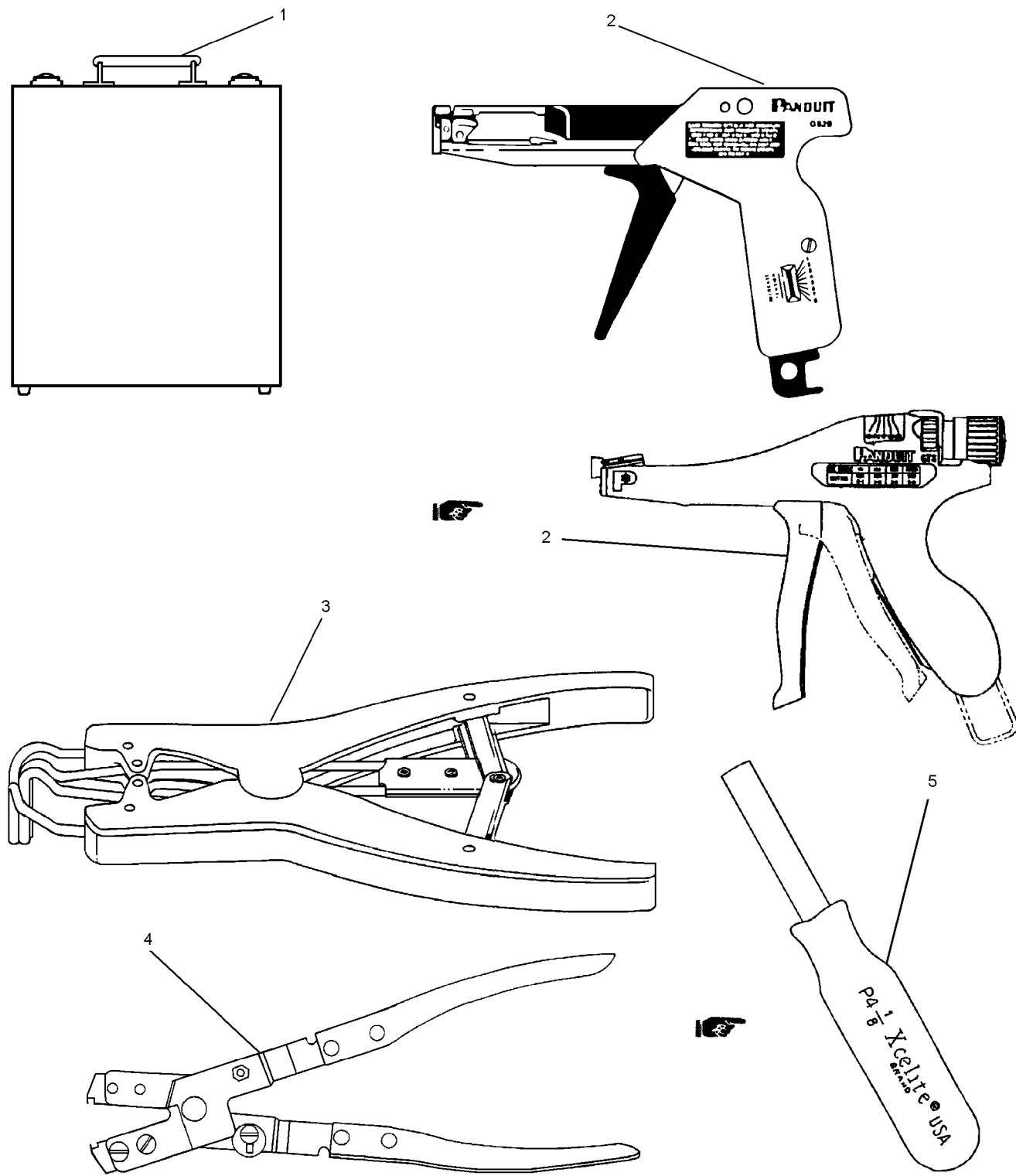


Figure 3-71. Special Support Equipment

003071

NAVAIR 13-1-6.10

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
3-71	—	EQUIPMENT, SPECIAL SUPPORT	REF	
-1	6200005	. TEST SET, RESPIRATOR ASSEMBLY A/E47T-28	1	
-2	MS90387-1	. TOOL, CABLE TIE, STANDARD OR EQUIVALENT	1	
	5120-00-937-5438	. TOOL, CABLE TIE, HEAVY DUTY	1	
-3	5120-01-124-0649	. ELASTRATOR	1	
	1502768	. SPANNER, RING NUT (NOT ILLUSTRATED)	1	
-4	14100055	. PINCER TOOL, LOW PROFILE	1	*
	5120-01-073-4187	. PLIERS, HOSE CLAMP (NOT ILLUSTRATED)	1	*
-5	191-382	. NUT DRIVER, 1/8 INCH (JENSEN TOOLS OR EQUIVALENT) (Note 1)	1	
Notes :		1. Available from Jensen Tools, Phone: 978-682-9844.		

NUMERICAL INDEX

Part Number	Figure and Index Number	SM&R Code
-------------	----------------------------	--------------

AN960-XC10L	3-58-11	
CL 6131	3-70-6	
CL 6225	3-58-9	PAOZZ
	3-63-2	PAOZZ
CL 6226	3-61-3	PAOZZ
	3-64-2	PAOZZ
CL 6227	3-66-5	PAOZZ
CL 6528	3-52-10	PAOZZ
CL 6592	3-65-10	PAGZZ
	3-69-3	PAGZZ
CL 6593	3-65-9	PAGZZ
	3-68-2	PAGZZ
DS-3-1500	3-52-7	PAOZZ
DS-3-1520	3-52-7	PAOZZ
MS35649-204	3-58-12	XAOZZ
MS90387-1	3-71-2	XAOZZ
1410055	3-71-4	XAOZZ
1500719	3-57-1	XAOZZ
1500720	3-57-4	XAOZZ
1500830	3-59-4	XAOZZ
1500831	3-64-1	PAGZZ
1500834	3-57-3	XAOZZ
1500835	3-57-2	PAGZZ
1500840	3-61-4	PAGZZ
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1500873	3-59-2	PAGZZ
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1500937	3-62-2	XAOZZ
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1500953	3-57-5	XAOZZ
	3-65-7	XAOZZ
1500955	3-55-3	XAOZZ
1500956	3-55-4	PAGZZ
1500982	3-70-3	XAOZZ
1500985	3-70-1	XAOZZ
1500986	3-70-1	XAOZZ
1500987	3-70-1	XAOZZ
1500988	3-70-1	XAOZZ
1500989	3-70-1	XAOZZ
1500990	3-70-1	XAOZZ
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	3-70	PAGGG
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	3-70	PAGGG

Part Number	Figure and Index Number	SM&R Code
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	3-70	PAGGG
1501015	3-51-2	PAGGG
	3-70	PAGGG
1501016	3-51-2	PAGGG
	3-70	PAGGG
1501017	3-51-2	PAGGG
	3-70	PAGGG
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1503626	3-56-4	XAOZZ
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	3-58	PAGGG
3297AS401-2	3-58-1	XAOZZ

NUMERICAL INDEX (Cont)

Part Number	Figure and Index Number	SM&R Code
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3297AS401-3	3-58-2	XAOZZ
3297AS401-4	3-58-3	XAOZZ
3297AS401-5	3-58-4	XAOZZ
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3297AS401-7	3-58-6	PAGZZ
3297AS401-8	3-58-7	PAGZZ
3297AS401-9	3-58-8	PAGZZ
3297AS402-1	3-58-10	XAOZZ
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3297AS601-1	3-52-8	PAOOO
3297AS601-2	3-52-8	PAOOO
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6089068	3-69-1	PAGZZ
6089075	3-62-3	PAGZZ

Part Number	Figure and Index Number	SM&R Code
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	3-53	PAGGG
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818539	3-61-1	PAGZZ

CHAPTER 4

A/P22P-14(V)1, A/P22P-14(V)2, A/P22P-14(V)3, AND A/P22P-14(V)4 RESPIRATOR ASSEMBLIES, ROTARY/FIXED WING AIRCREW, CBR PROTECTIVE

Section 4-1. Description

4-1. GENERAL.

4-2. A/P22P-14(V)1 thru (V)4 Chemical, Biological and Radiological (CBR) Respirator Assemblies are designed to protect rotary wing and fixed wing aircrewmembers from the toxic and lethal effects of chemical, biological and nuclear agents from ground level to a 43,000 foot cabin altitude (depending upon configuration).

4-3. The Respirator Assemblies consist of a Mask Assembly, Lower Assembly, Intercom Unit, CMU-29(V)1/P or 2/P Vest, transit case, and standard additional flight equipment (figures 4-1 thru 4-4).

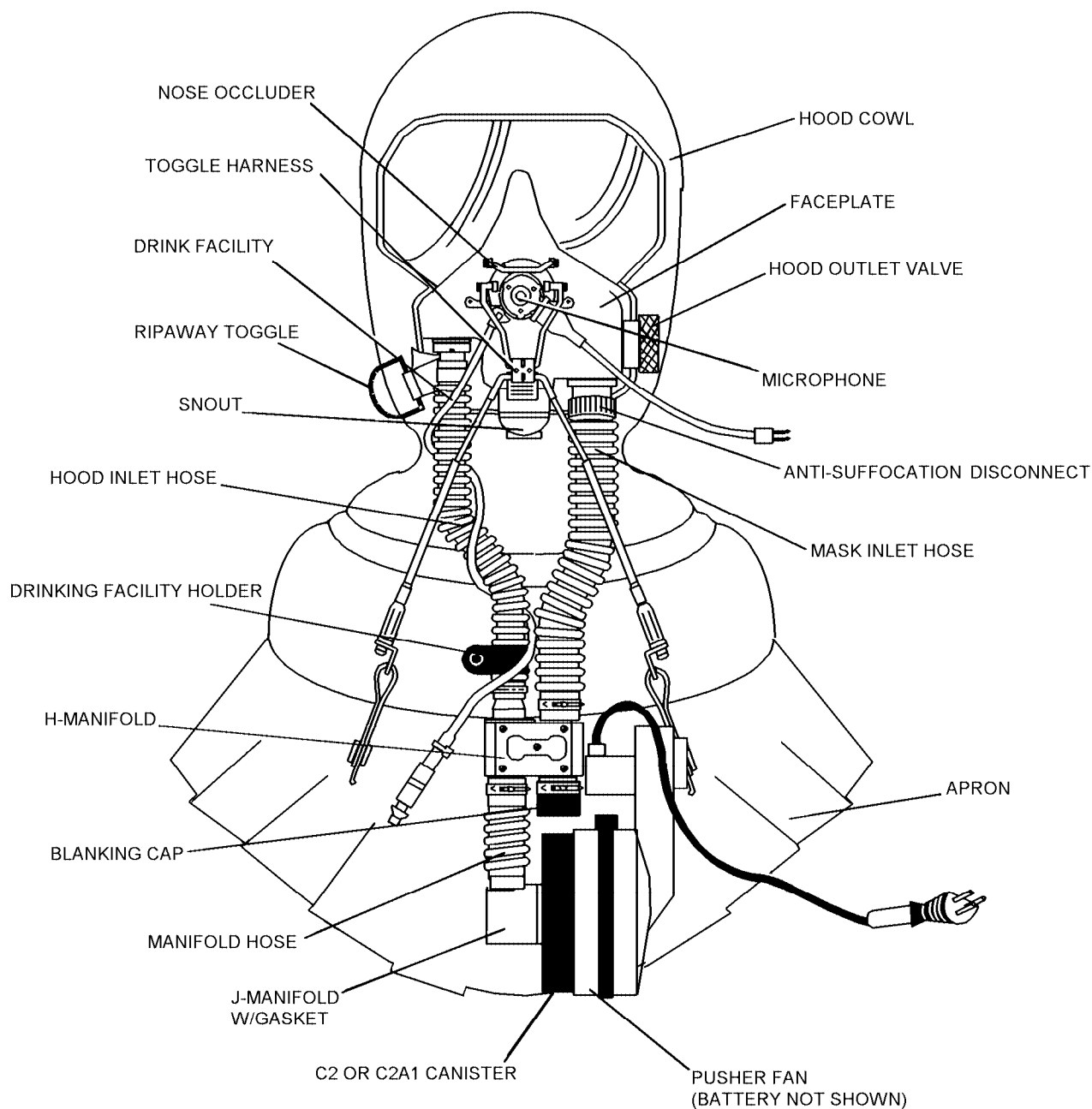
4-4. CONFIGURATION.

4-5. Respirator assemblies are provided in four configurations: A/P22P-14(V)1 Non-oxygen (figure 4-1), A/P22P-14(V)2 LOX (figure 4-2), A/P22P-14(V)3 OBOGS (figure 4-3) and A/P22P-14(V)4 Panel Mounted Regulator (figure 4-4). Variant designation determines aircraft application as defined by the type of oxygen equipment employed or the absence of an oxygen facil-

ity (see paragraph 4-55). All variants may be equipped with a nose occluder kit for the mask. Lower Assembly components common to each respiratory assembly designation include the H-Manifold, Manifold Hose and Pusher Fan Subassembly. Oxygen-equipped variants include an additional H-Manifold Hose, 90 ° Rubber Molding and appropriate plumbing to connect to Non-oxygen, LOX, OBOGS or Panel Mounted oxygen delivery systems. The pusher fan subassembly and 90° rubber molding each employ a C2 or C2A1 filter canister to supply contaminant-free air and/or oxygen for the respirator assemblies.

4-6. COMPONENT DESCRIPTION.

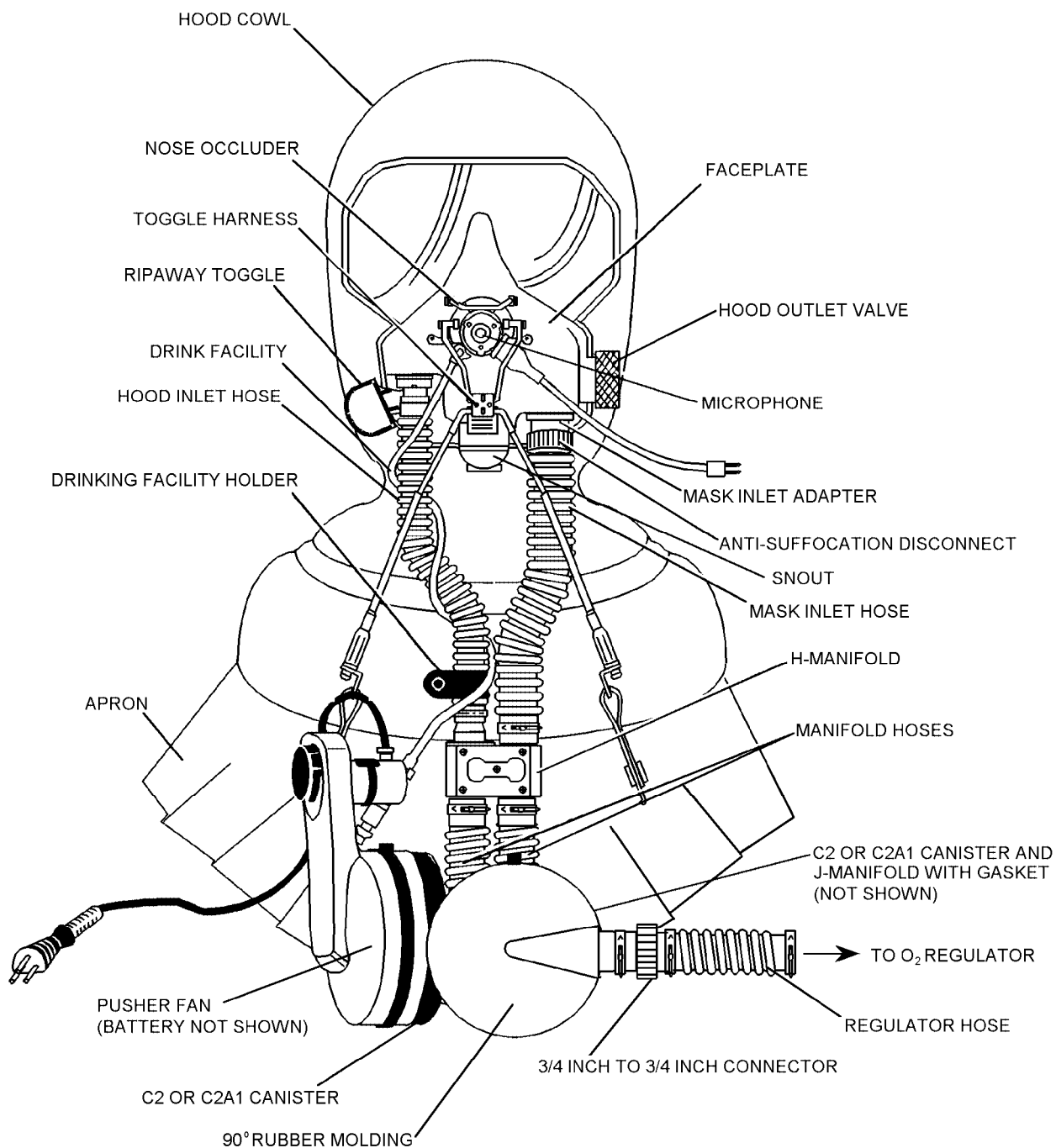
4-7. MASK ASSEMBLY. The mask (figure 4-5) is common to all respirator assembly variants and is available in five sizes: XL, L, S, XS and XXS of which only the S and L sizes are readily available (refer to sizing matrix, table 4-1). Custom fit sizes XL, XS and XXS are only available by contacting the Naval Air Warfare Center, Aircraft Division, Code 4.6.3.1, Patuxent River, MD 20670-1906 DSN (301) 342-8850. The (V)2 through (V)4 variants incorporate a modified hood which allows increased head mobility.



NOTE: INTERCOM UNIT, VEST AND TRANSIT CASE NOT SHOWN

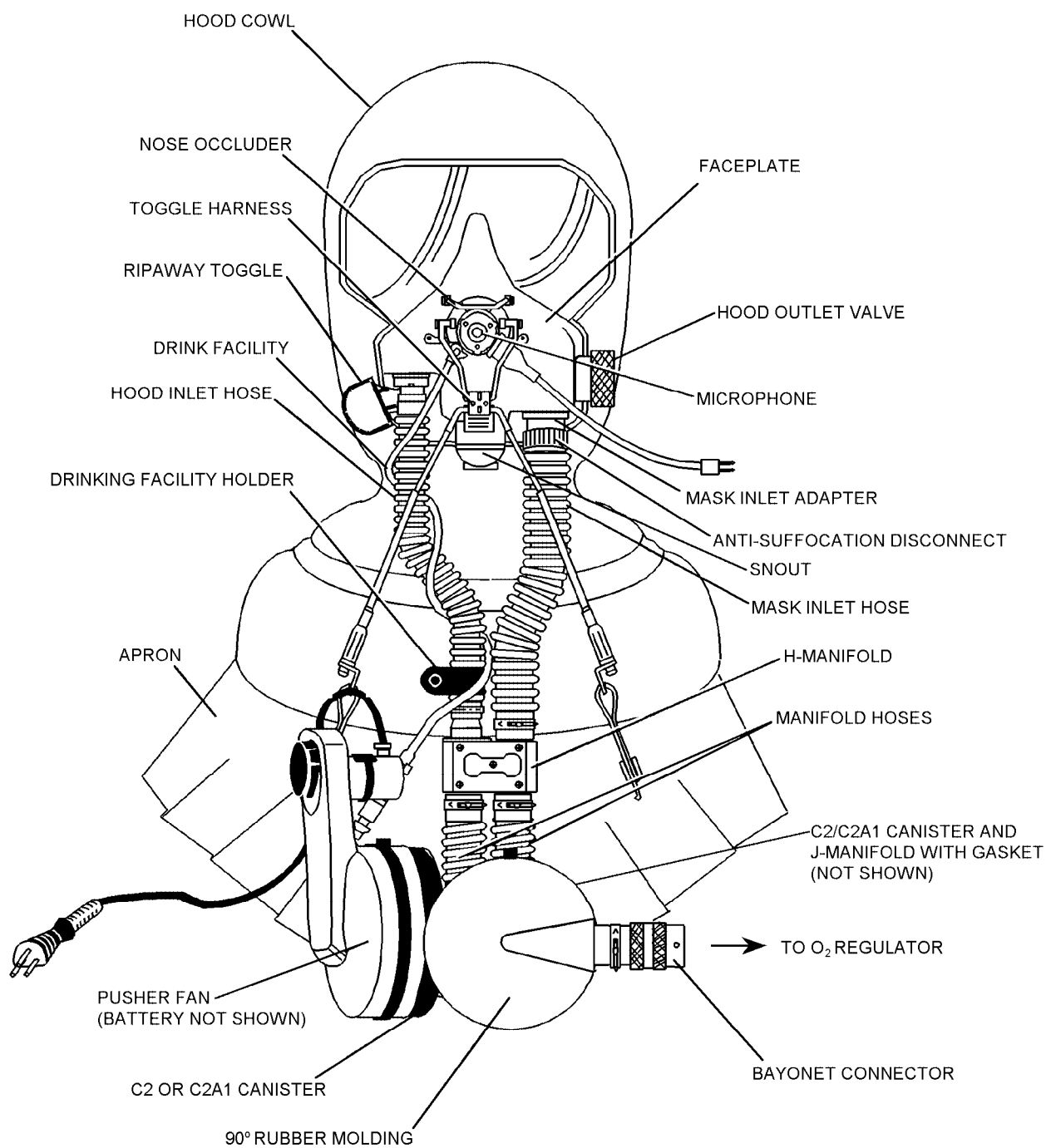
Figure 4-1. A/P22P-14(V)1 Respirator Assembly - Non-Oxygen Variant

4-1



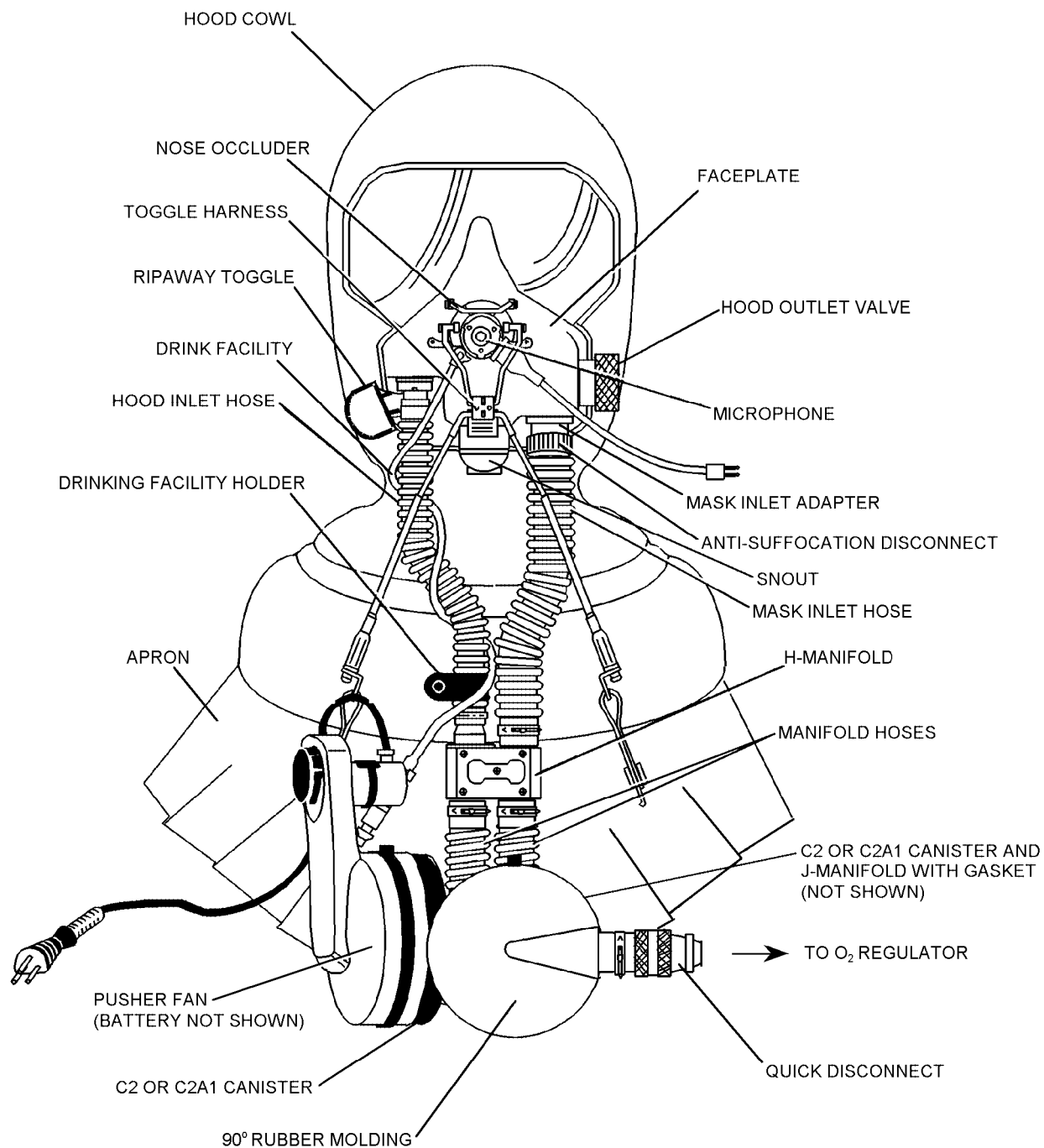
NOTE: INTERCOM UNIT, VEST AND TRANSIT CASE NOT SHOWN

Figure 4-2. A/P22P-14(V)2 Respirator Assembly - LOX Variant



NOTE: INTERCOM UNIT, VEST AND TRANSIT CASE NOT SHOWN

Figure 4-3. A/P22P-14(V)3 Respirator Assembly - OBOGS Variant



NOTE: INTERCOM UNIT, VEST AND TRANSIT CASE NOT SHOWN

Figure 4-4. A/P22P-14(V)4 Respirator Assembly - Panel Mount Variant

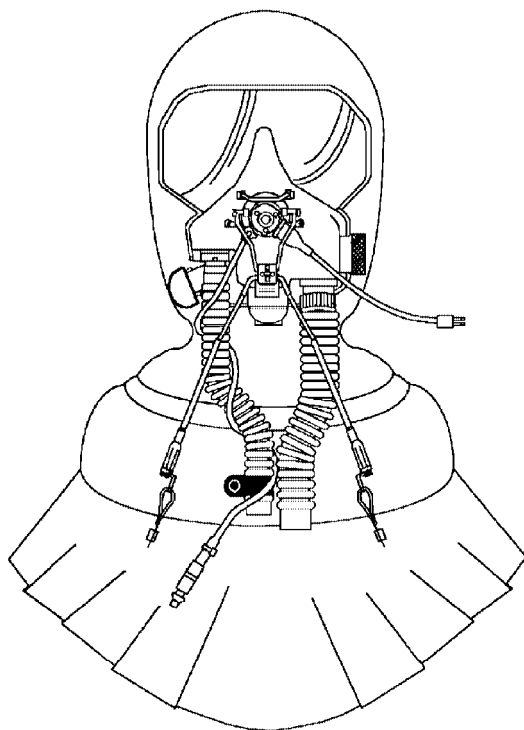


Figure 4-5. Mask Assembly

4-5

4-8. Hood Assembly. The hood assembly, shown in figure 4-6, is made of bromo-butyl rubber, covers the entire head and is bonded to the faceplate, neck seal and bellows. The neck seal, available in two sizes: standard and small, is made of natural rubber and, together with the hood and faceplate, isolates the head and neck. The (V)2 through (V)4 variants include a modified hood which allows for increased head mobility. The hood cowl is available in three sizes: extra-small, standard and extra-large.

4-9. Faceplate. A molded, one-piece, polycarbonate faceplate (figure 4-7) is sealed into the front of the hood. The upper part, or optical area, is transparent. The lower part (painted black) is shaped to fit the wearer's lower face. Attached to or mounted on the faceplate is a nose occluder, orinasal mask, toggle harness, mask inlet adapter, drink facility, and a microphone assembly. A strip of foam rubber is bonded over the sealing strip (on the inside) for comfort when the hood is worn.

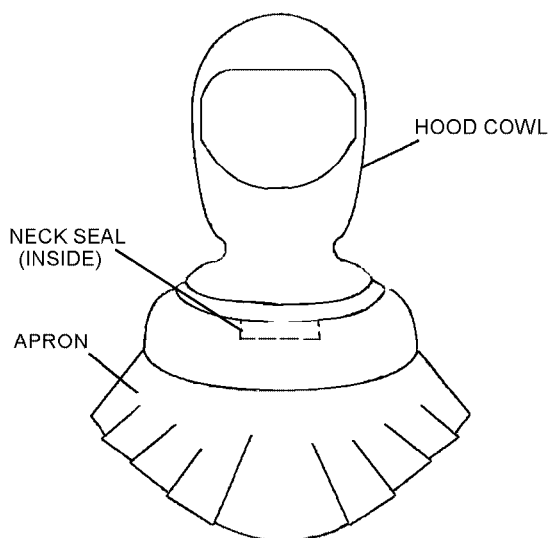


Figure 4-6. Hood Assembly

4-6

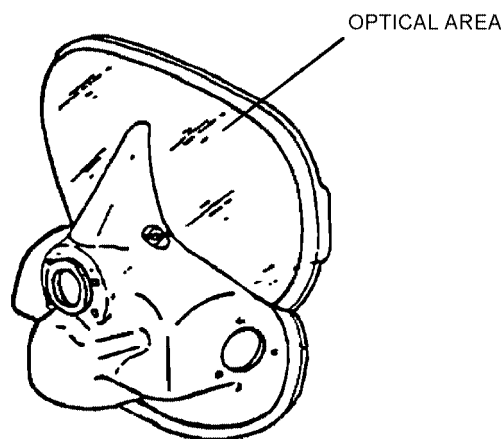


Figure 4-7. Faceplate

4-7

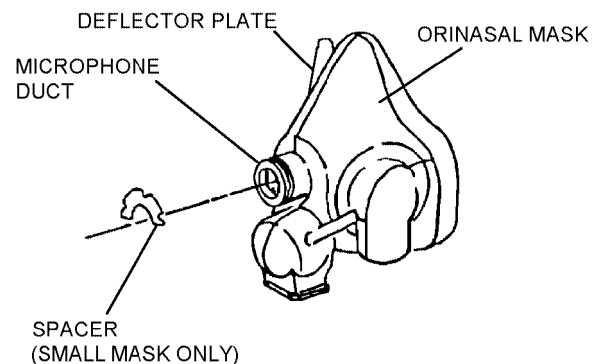
Table 4-1. Sizing Matrix

Variant	Mfg. Part No.	Sizes			
		Mask Assembly	Hood	Neck Seal	Orinasal Mask
(V)1	CL 6360	XL	XL	STD	L
	CL 6361	L	STD	STD	L
	CL 6362	S	STD	STD	S
	CL 6363	XS	XS	STD	S
	CL 6364	XXS	XS	S	S
(V)2	CL 6365	XL	XL	STD	L
	CL 6366	L	STD	STD	L
	CL 6367	S	STD	STD	S
	CL 6368	XS	XS	STD	S
	CL 6369	XXS	XS	S	S
(V)3	CL 6370	XL	XL	STD	L
	CL 6371	L	STD	STD	L
	CL 6372	S	STD	STD	S
	CL 6373	XS	XS	STD	S
	CL 6374	XXS	XS	S	S
(V)4	CL 6375	XL	XL	STD	L
	CL 6376	L	STD	STD	L
	CL 6377	S	STD	STD	S
	CL 6378	XS	XS	STD	S
	CL 6379	XXS	XS	S	S

NOTE

The left or right side refers to the aircrew-member's left or right side when wearing the mask.

4-10. Orinasal Mask. The orinasal mask (figure 4-8), is molded of soft silicone rubber and fits over the wearer's nose and mouth. The green colored orinasal mask incorporates a turned-under edge, increasing the seal around the wearer's face. The orinasal mask is mounted within the shaped faceplate. Located on the right side of the orinasal mask is an externally-mounted deflector plate constructed of Noryl plastic. This plate deflects the air across the faceplate, keeping the optical area mist-free. Other components located within the orinasal mask are the inhalation valve, compensated exhalation valve, microphone, and drink facility port. The orinasal mask is available in two sizes: Large (P - designation on inside of mask) and Small (Q - designation on inside of mask).

**Figure 4-8. Orinasal Mask**

4-8

4-11. Faceplate Ripaway Toggle. The faceplate ripaway toggle (figure 4-9) consists of a rubber coated nylon strip and attached D-ring on the lower right portion of the faceplate. The nylon strip bonds the faceplate to the butyl cowl. Pulling the ripaway toggle creates a slit between the faceplate and cowl. The faceplate can then be removed from the cowl by placing fingers into the slit and pulling the faceplate from the cowl. Once the faceplate is removed, the mask shall be taken out of service.

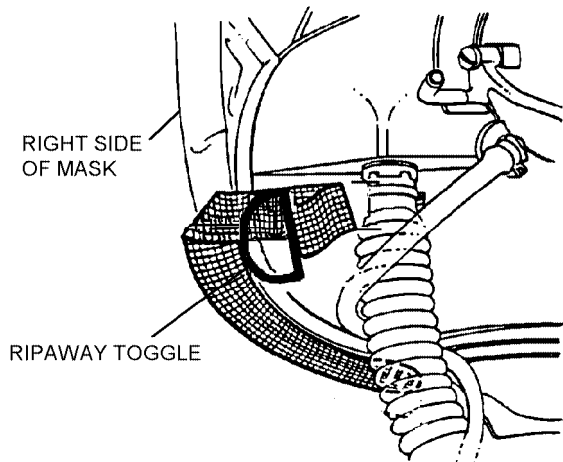
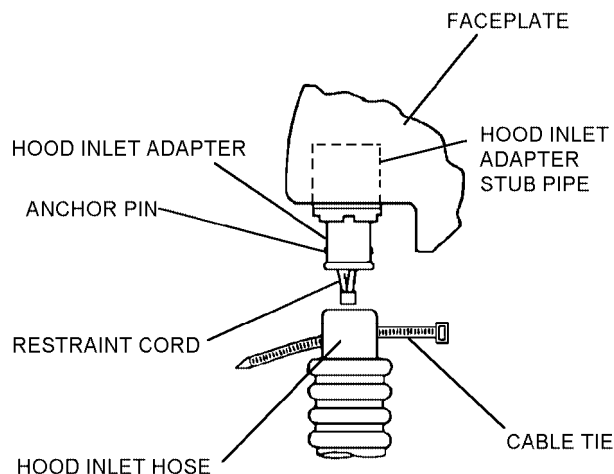


Figure 4-9. Faceplate Ripaway Toggle

4-12. Hood Inlet Adapter. The hood inlet adapter (figure 4-10) is positioned within a port to the right side of the faceplate and connects the hood inlet hose from the H-manifold assembly to the hood compartment of the mask.

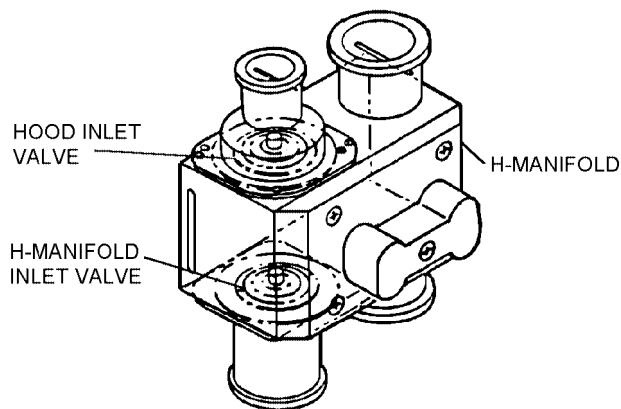


4-10

Figure 4-10. Hood Inlet Adapter

4-13. Hood Inlet Valve. The hood inlet valve is located within the H-manifold (figure 4-11). The valve consists of a stepped rubber valve and valve seat. The valve prevents air from being drawn from the hood compartment into the orinasal mask via the H-manifold.

4-14. H-Manifold Inlet Valve. The H-Manifold inlet valve is located within the H-manifold (figure 4-11). The valve consists of a stepped rubber valve and valve seat. The valve prevents (V)2 through (V)4 variant oxygen from leaking through the pusher fan in the event of pusher fan failure (figure 4-38).



4-11

Figure 4-11. H-Manifold and Valves

4-15. Hood Outlet Valve. The hood outlet valve (figure 4-12) is mounted on the left side of the faceplate, below the optical area and above the mask inlet adapter on the orinasal mask. The valve consists of a stepped rubber valve, valve seat, an external slotted cover, and a manually operated shut-off disc. The hood outlet valve permits demisting air to exit the hood. The valve is normally in the open position. The valve is closed if the demisting air is lost, i.e. pusher pan failure, in order to prevent entry of contaminants.

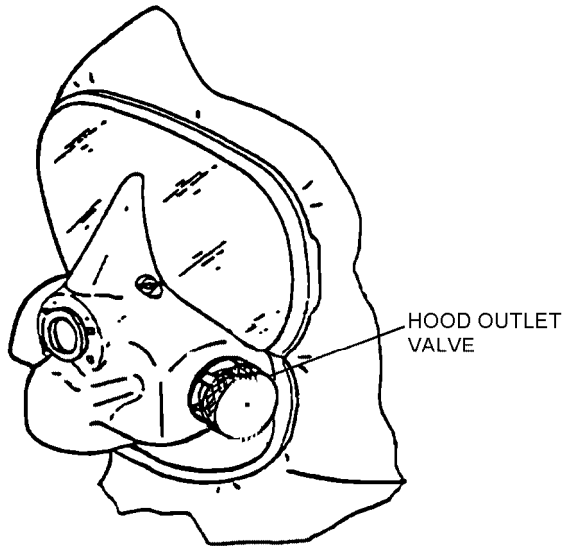


Figure 4-12. Hood Outlet Valve

4-16. Inhalation Valve and Iceguard. The inhalation valve (figure 4-13), mounted on the left side of the orinasal mask, consists of a molded plastic valve seat, with a stepped rubber valve inserted into the molding by its shaft. An iceguard, in the form of a fine mesh, covers the outlet port of the valve. The iceguard is retained in position by lugs engaging slots in the valve seat. The inhalation valve reseats during exhalation, making it easier to exhale while preventing excessive loss of oxygen or air through the compensated exhalation valve.

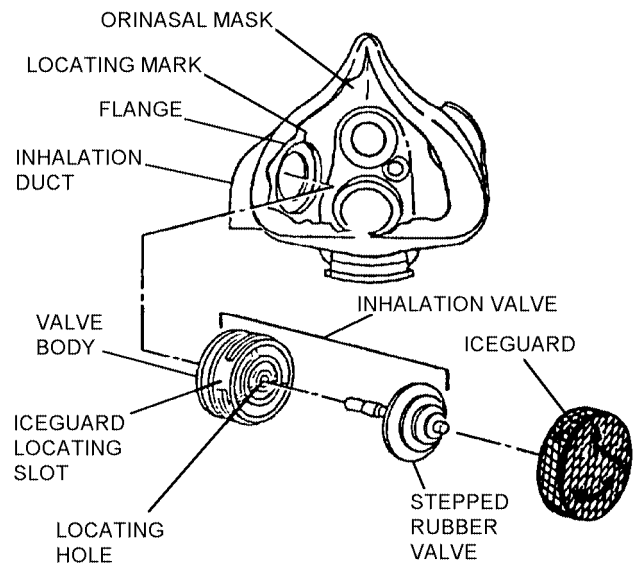


Figure 4-13. Inhalation Valve

4-13

4-17. Compensated Exhalation Valve. The compensated exhalation valve (figure 4-14) is a molded plastic outlet valve mounted within the exhalation duct of the orinasal mask, with its compensated chamber connected to the orinasal mask inlet. The purpose of the compensated exhalation valve is to allow exhaled gases to be expelled into the environment when the pressure inside the orinasal mask is greater than the pressure in the outlet housing chamber.

4-18. Exhalation Outlet Valve. The exhalation outlet valve (figure 4-14) is a secondary valve fitted in the exhalation duct below the compensated exhalation valve. The exhalation outlet valve consists of a stepped rubber valve positioned on a valve holder which is secured by an externally-mounted spacer washer and ring nut. This secondary valve will prevent the inward leakage of contaminated air in the event of the compensated exhalation valve sticking in the open position. The small volume of air trapped between the compensated exhalation valve and the exhalation outlet valve will greatly reduce inward leakage in the event of pusher fan failure.

4-19. Snout. The snout (figure 4-14) is secured to the ring nut securing the exhalation outlet valve to the faceplate. The snout, made from material of low thermal conductivity, acts as a chamber to trap the warm exhaled air and prevents freezing of the exhalation valves. The snout opens to the environment by a downward facing slot.

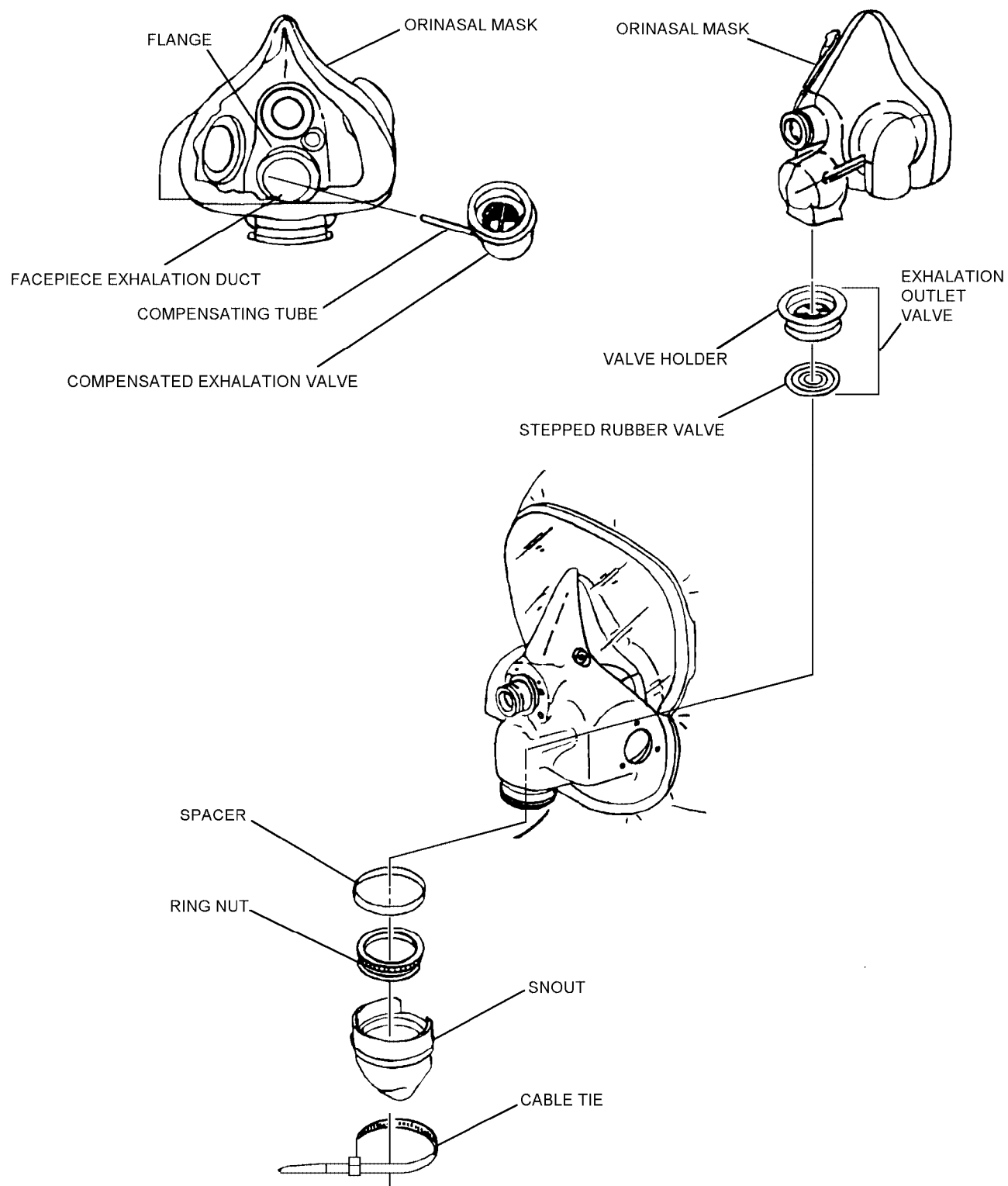


Figure 4-14. Compensated Exhalation Valve, Exhalation Outlet Valve and Snout

WARNING

If the canteen is disconnected in a CBR contaminated environment, do not reconnect until all matching connectors are free of contamination.

4-20. Drink Facility. The drink facility (figure 4-15) consists of an internal drink tube (mouthpiece) located within the orinasal mask, a butyl external drink tube that is wrapped around the hood inlet hose, and a self-sealing quick disconnect at the canteen end. The quick disconnect is stored in the drink facility quick disconnect holder on the hood inlet hose when not in use. To drink, attach to the M-1 canteen cap on a two quart collapsible canteen, fitted with a shoulder strap. The facility is CBR resistant and may be used in a contaminated environment, if connected to the canteen in an uncontaminated environment. For additional information, see the applicable aircraft NATOPS manual.

4-21. Toggle Harness Assembly. The toggle harness assembly (figure 4-16) is mounted on the front of the faceplate around the microphone. The assembly is held in place by four (4) countersunk screws which pass through the mask harness assembly and into the faceplate. The screws are drawn tight by four self-locking nuts. A V-shaped hinged bow (V-bow), which freely pivots upward or downward, is suspended from two rectangular studs protruding from the mask harness assembly. Attached to the end of the bow is a toggle plate which pivots upward and downward, and provides the tension for tightening the mask to the aircrewmember's face. Two toggle harness cables are connected to

the toggleplate, and each is fitted with an adjustable swivel link which allows the insert assemblies to be adjusted approximately 1 inch in length for proper mask tension. The swivel link is connected to the CBR adapter strap and is the connector used to couple a helmet to the mask. When coupling, the toggle harness cables should lie over the hooks on the V-bow before the CBR adapter strap is connected to the helmet.

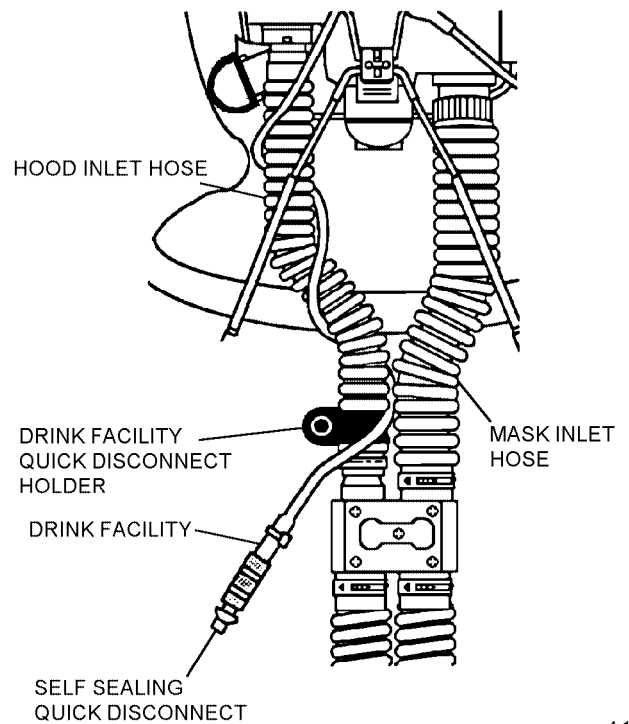


Figure 4-15. Drink Facility

4-15

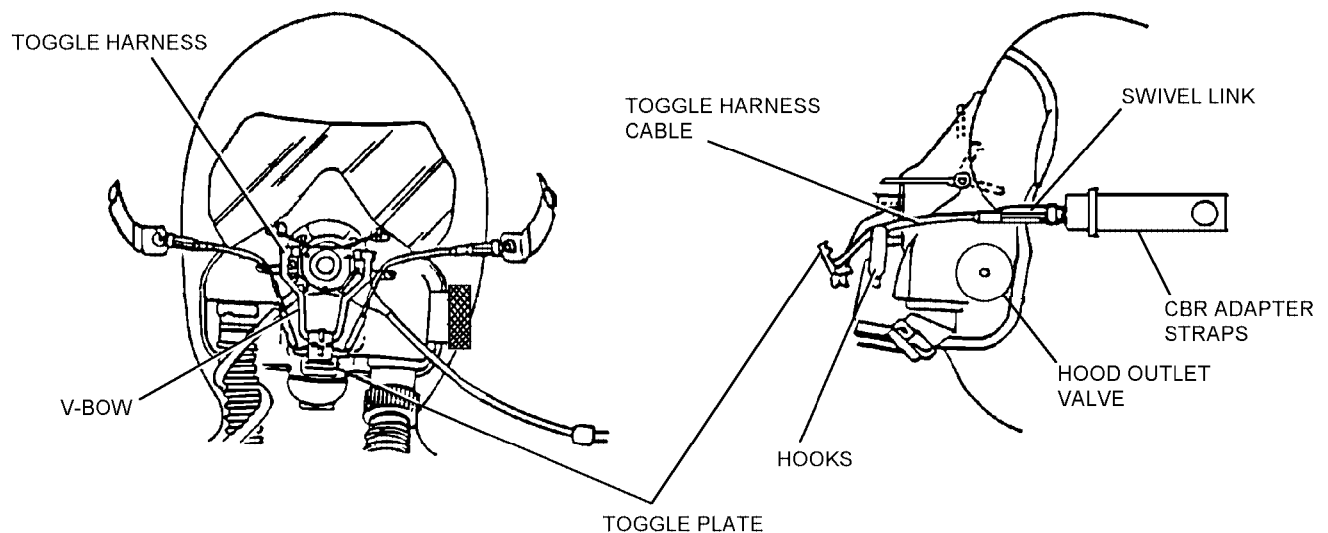


Figure 4-16. Toggle Harness Assembly

4-16

4-22. Microphone Assembly. The microphone assembly (figure 4-17) consists of a microphone, microphone cable, and terminal plug that is connected to a communication cable for either aircraft or ground use. The microphone is installed in the microphone duct which extends through the opening in the center of the faceplate. The microphone is retained in place by a plastic cable tie, cinched around the rubber portion of the orinasal mask that protrudes outward through the faceplate.

4-23. Mask Inlet Hose. The mask inlet hose connects the H-manifold to the mask inlet adapter and includes a restraint cord which prevents excessive stretching.

4-24. Hood Inlet Hose. The hood inlet hose connects the H-manifold to the hood inlet adapter and includes a restraint cord which prevents excessive stretching.

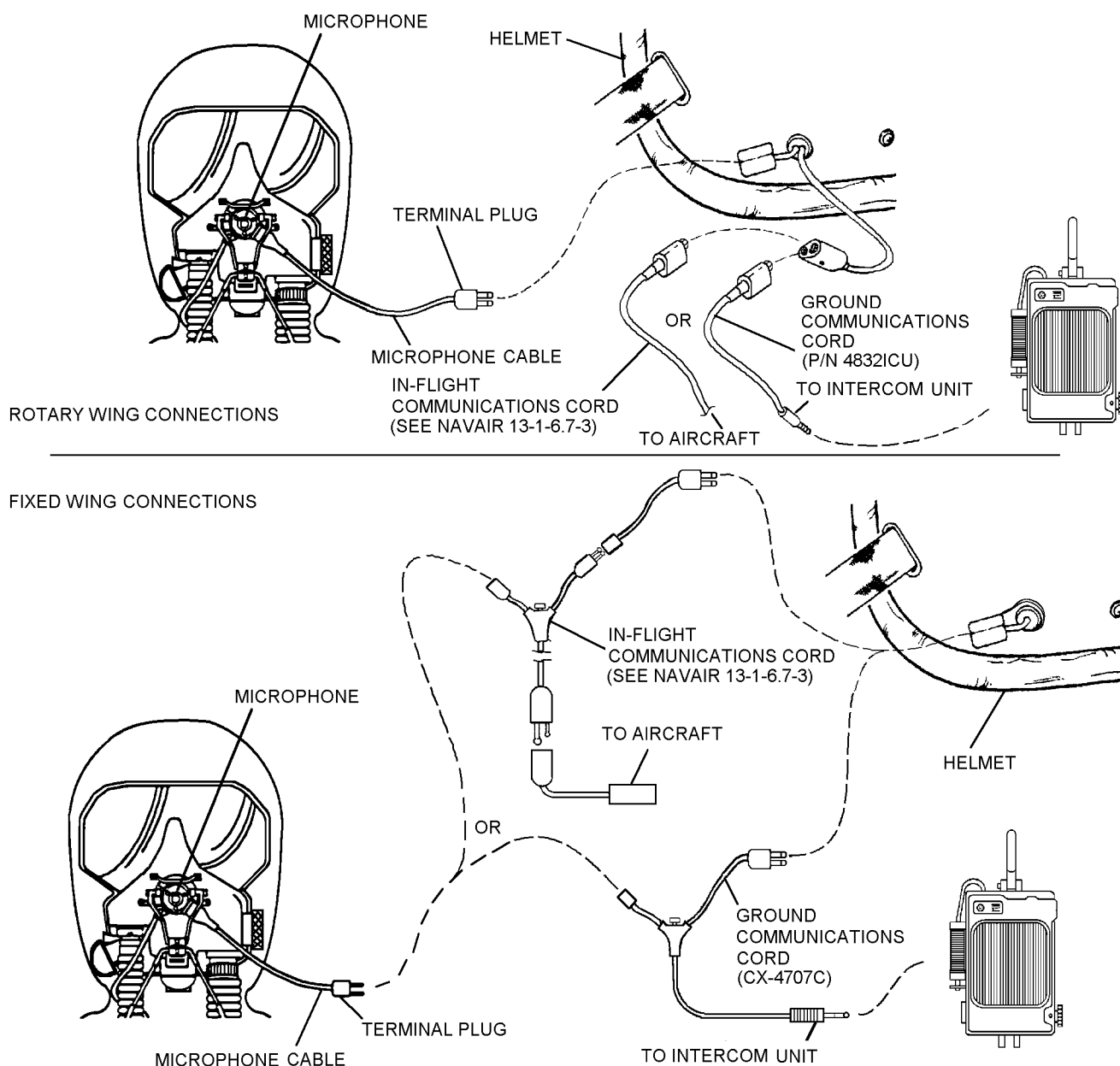
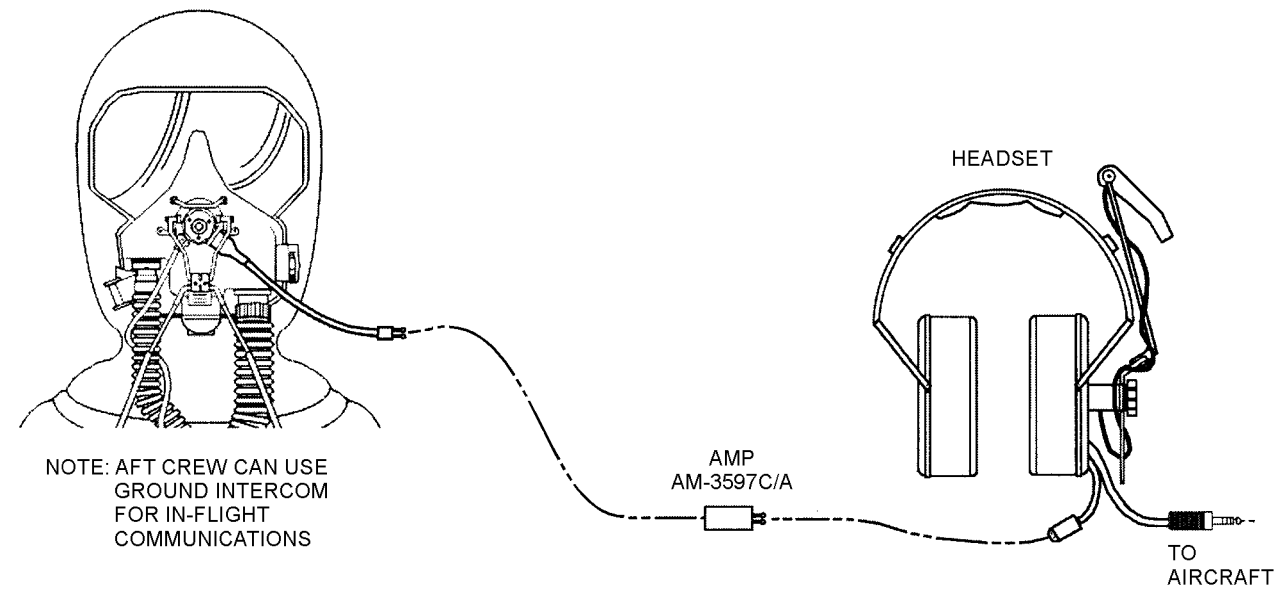


Figure 4-17. Microphone Assembly (Sheet 1 of 3)

00401701



C-9 FLIGHT MODE

C-9 GROUND MODE

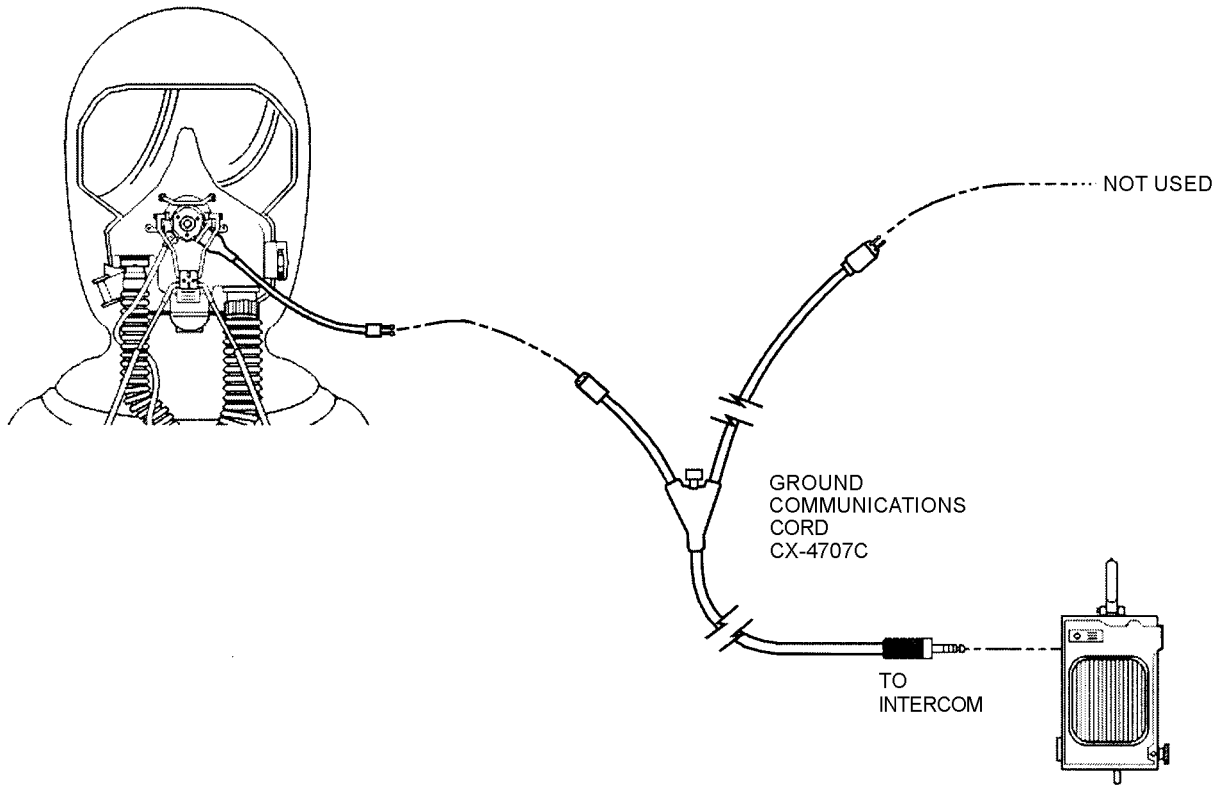
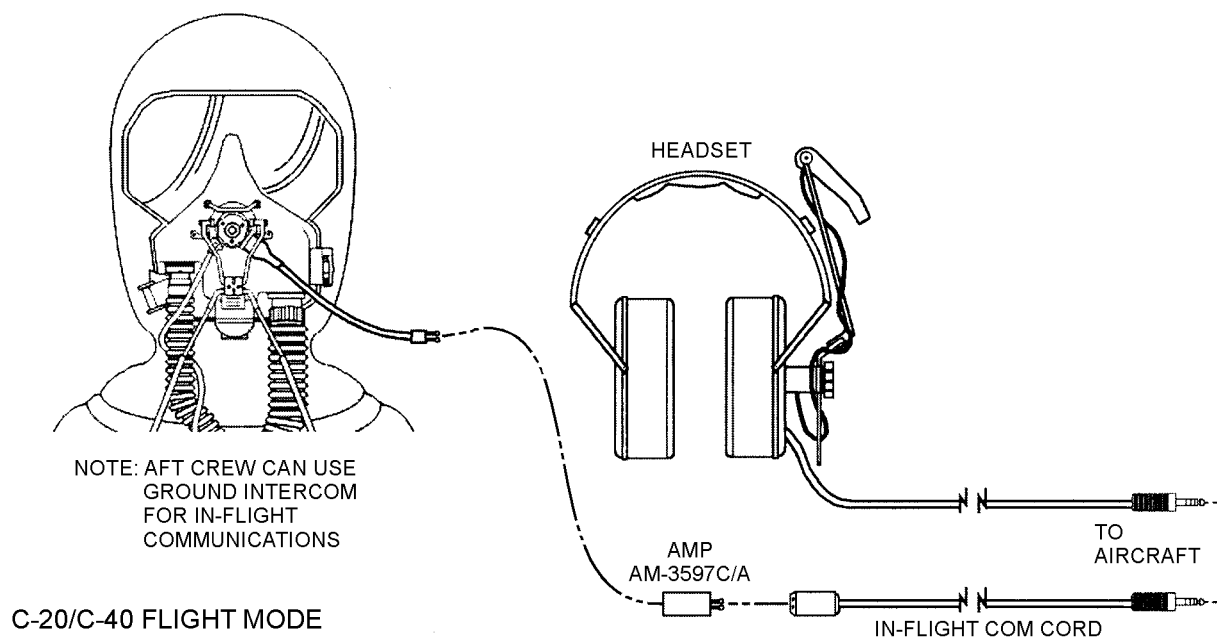


Figure 4-17. Microphone Assembly (Sheet 2)

00401702



C-20/C-40 GROUND MODE

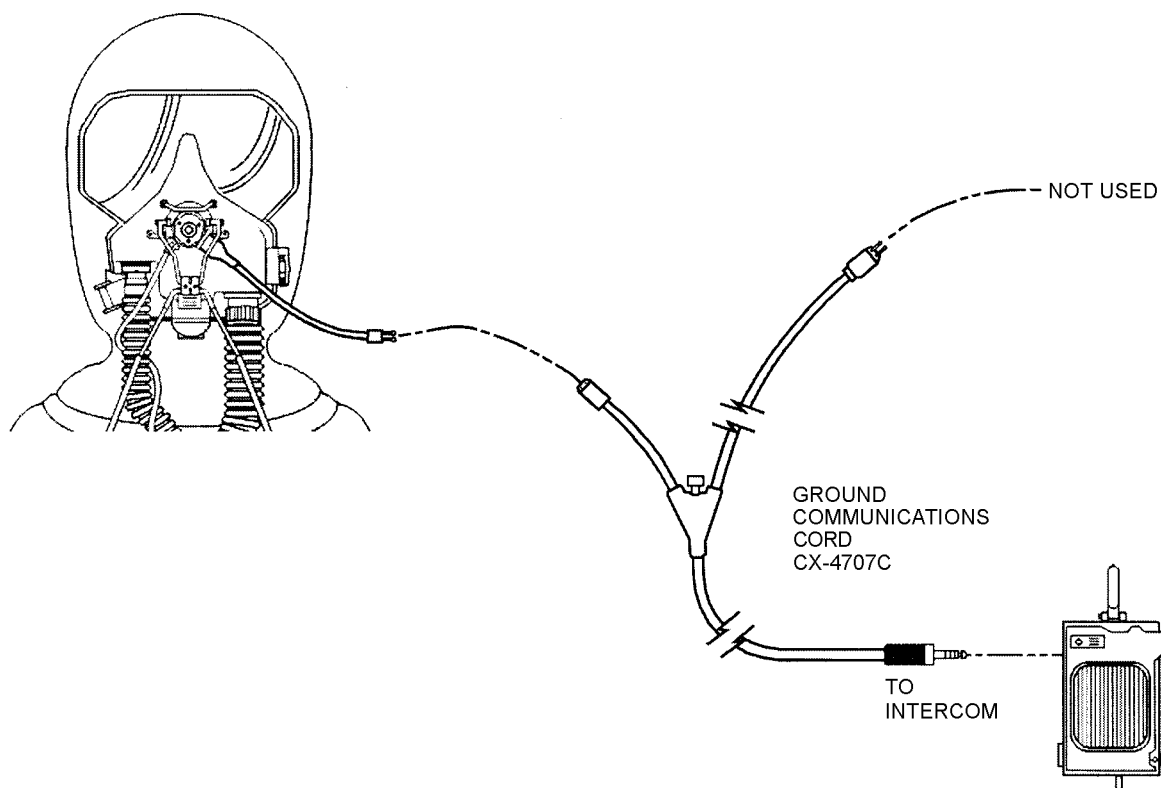
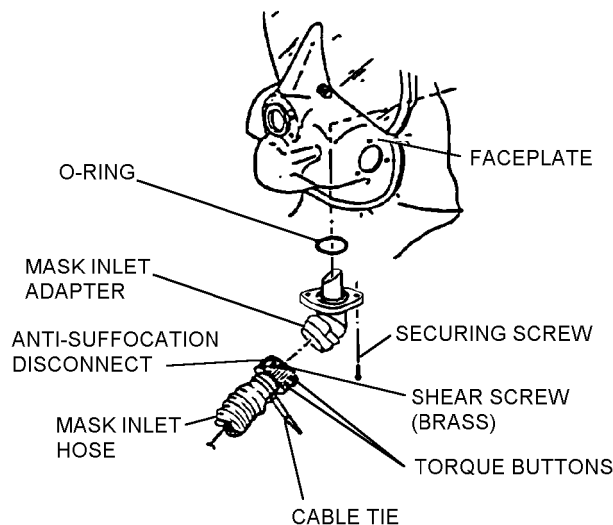


Figure 4-17. Microphone Assembly (Sheet 3)

00401703

4-25. Anti-Suffocation Disconnect. The anti-suffocation disconnect, located at the upper end of the mask inlet hose, is manually unlocked from the mask inlet adapter on the faceplate by an inward clockwise rotation of a knurled locking ring (toward the mask) which breaks a shear screw (figure 4-18). Two (2) torque buttons aid in application of pressure to break the shear screw for quick disconnect in emergency situations. The mask inlet hose may then be separated from the mask inlet adapter by pulling firmly down on the hose.



4-18

Figure 4-18. Anti-Suffocation Disconnect

4-26. Mask Inlet Adapter. The mask inlet adapter (figure 4-19) is mounted at the left bottom edge of the faceplate. The mask inlet adapter facilitates the locking of the anti-suffocation disconnect to the faceplate.

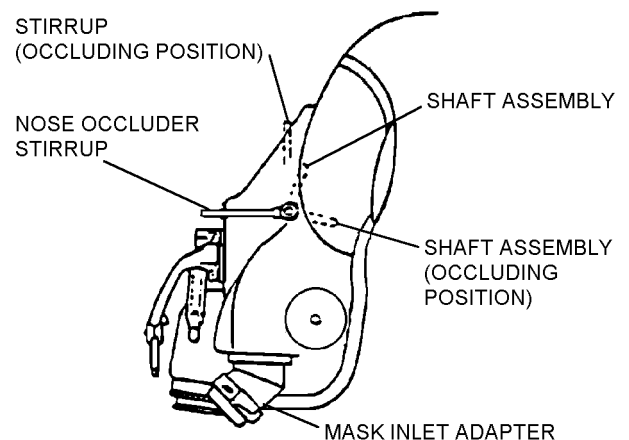
WARNING

Either a nose occluder or butyl blanking plugs must be installed to ensure CBR protection.

NOTE

The (V)1 helicopter variant is authorized to use either a nose occluder assembly or a butyl blanking plug. The (V)2, (V)3, or (V)4 fixed wing variant is only authorized to use a nose occluder assembly.

4-27. Nose Occluder. The nose occluder assembly (figure 4-19) is mounted through the nose bridge of the faceplate. The assembly is available in sizes ranging from 4 mm to 7 mm, in increments of 1 mm in both short and long size ranges. The occluder consists of a pair of shaft subassemblies with nylon rollers that can be swept down over the nose area of the orinasal mask.



4-19

Figure 4-19. Mask Inlet Adapter and Nose Occluder

4-28. LOWER ASSEMBLY. The lower assembly (figure 4-20) consists of the H-manifold, manifold hoses, J-manifold, pusher fan subassembly, and oxygen delivery subassembly, as applicable

4-29. H-Manifold. The H-manifold (figure 4-21) is a four port crossover valve. Receiving connecting hoses from the mask and hoses from the pusher fan subassembly and oxygen delivery subassembly (variants (V)2 - (V)4).

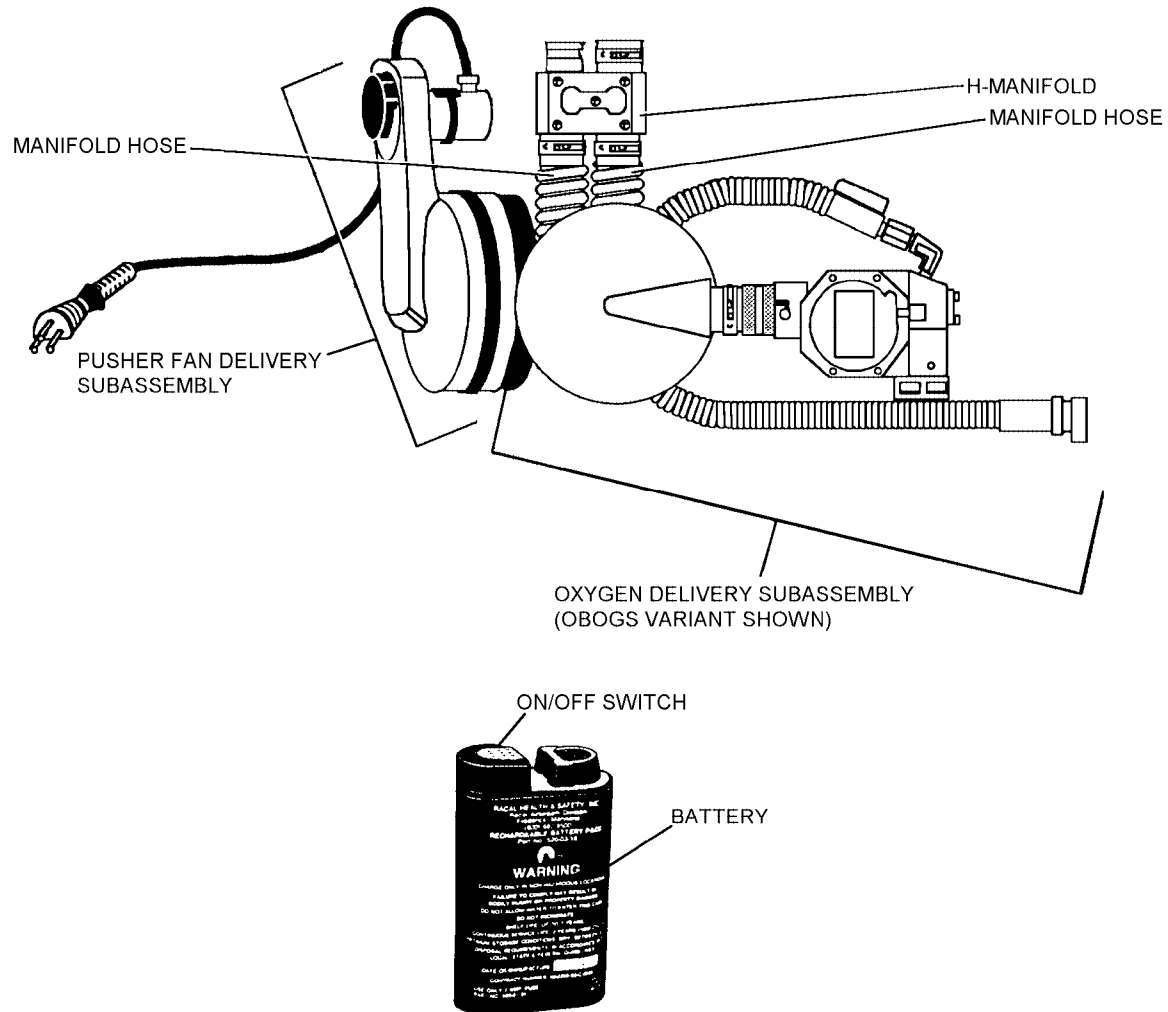


Figure 4-20. Lower Assembly ((V)3 Variant Shown)

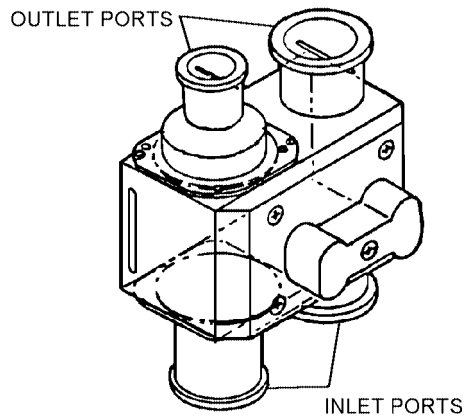


Figure 4-21. H-Manifold

4-21

4-30. Manifold Hoses (figure 4-23). The manifold hoses are constructed of ethylene propylene rubber, corrugated for flexibility, and are 3 inches in length. The right-side H-manifold hose connects the H-manifold to the pusher fan and canister assembly via the J-manifold. The 3/4 inch end of the hose is secured to the

right inlet port of the H-manifold and the 7/8 inch end is secured to the J-manifold using low profile clamps. The left-side H-manifold hose connects the H-manifold to the oxygen delivery subassembly via a J-manifold. The 3/4 inch end of the hose is secured to the left inlet port of the H-manifold and the 7/8 inch end is secured to the J-manifold, using low profile clamps.

4-31. J-Manifold. The J-manifold (figures 4-22 and 4-24) is manufactured from aluminum stock. The large circular end of the manifold is threaded to accept a C2 or C2A1 canister and contains a rubber gasket that provides the canister with an airtight seal. The other end is connected to the manifold hose and is secured with stepless low profile clamps.

4-32. Pusher Fan Subassembly. The pusher fan subassembly (figure 4-22) is common to all the respirator assembly variants and consists of the J-manifold with gasket, C2 or C2A1 canister and pusher fan with battery.

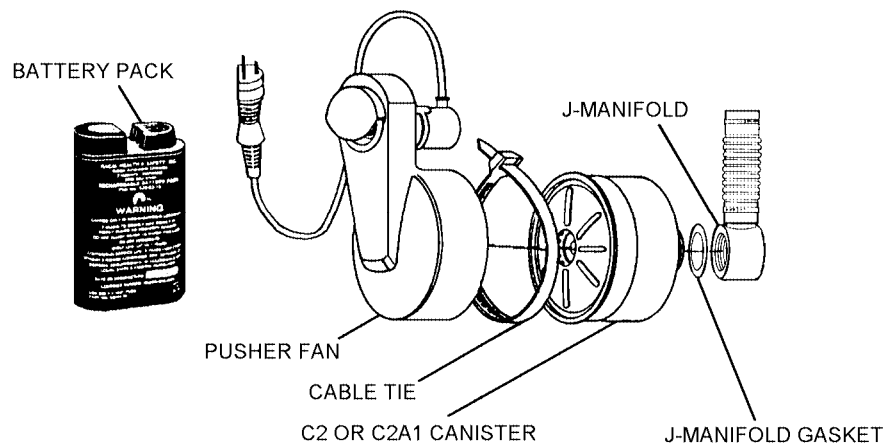


Figure 4-22. Pusher Fan Subassembly

4-22

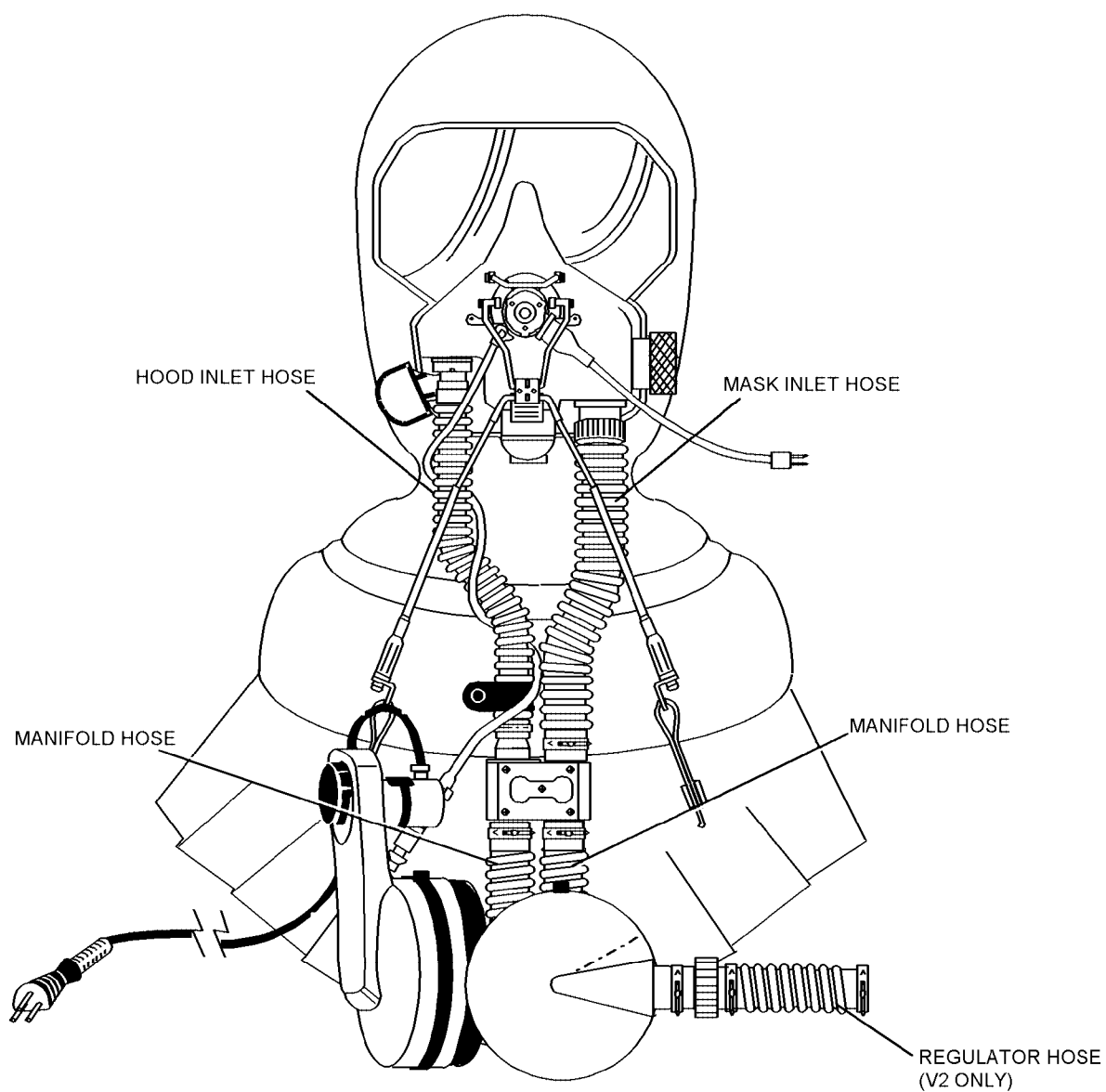


Figure 4-23. Respirator Assembly ((V)2 Variant Shown)

4-33. Canister. The C2 canister is a standard, NATO approved, charcoal filter canister. It is currently being replaced by the C2A1 canister. Either the C2 or C2A1 canister may be used with the A/P22P-14(V)1 thru (V)4 respirator assemblies.

4-34. Pusher Fan with Battery. The pusher fan consists of a molded rubber boot housing with an internal centrifugal fan. An electric cord connects the fan to a rechargeable NiCad battery or a disposable Lithium battery (see [Chapter 6](#)). The NiCad battery is a self-contained unit capable of providing 3 1/2 - 4 hours of continuous power at moderate temperatures. The Lithium battery will provide 10+ hrs. of continuous power in colder climates. An ON/OFF push switch is located on top of the battery. The large, open end of the rubber boot fits over the C2 or C2A1 canister and is secured with a cable tie.

4-35. Oxygen Delivery Subassembly. The oxygen delivery subassembly ([figures 4-24 and 4-26 thru 4-28](#)) is applicable to the A/P22P-14(V)2 thru A/P22P-14(V)4 respirator assemblies. The subassembly components consist of manifold hoses and clamps, J-manifolds with

gaskets, C2 or C2A1 canisters, 90° rubber moldings, clamps, cable ties, and applicable interface fittings. The following components are common to all oxygen delivery subassemblies:

4-36. Canister. The C2 canister is a standard, NATO approved, charcoal filter canister. It is currently being replaced by the C2A1 canister. Either the C2 or C2A1 canister may be used with the A/P22P-14(V)1 through (V)4 respirator assemblies.

4-37. 90° Rubber Molding. The 90° rubber molding is a rubber boot with a large opening at one end that fits over the C2 or C2A1 canister and is secured with a cable tie. The other end is secured to a 3/4 inch to 3/4 inch connector (with hose), bayonet connector, or quick disconnect fitting with a stepless low profile clamp.

4-38. UNIQUE COMPONENTS. Identified by designation, the following is a list of components unique to individual variants of the A/P22P-14(V)1 through (V)4 Respirator Assemblies.

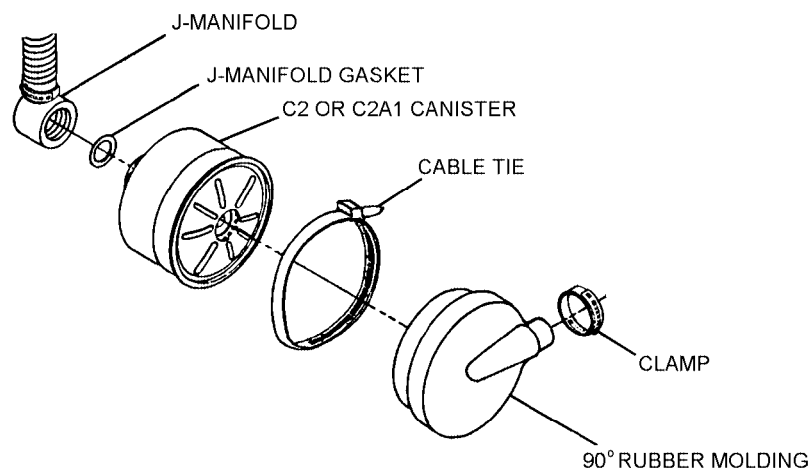
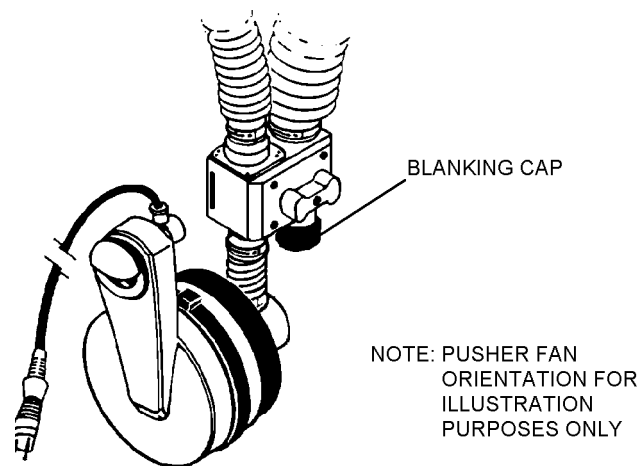


Figure 4-24. Oxygen Delivery Subassembly - Components Common to all (V)2 thru (V)4 Respirator Assemblies

4-24

4-39. A/P22P-14(V)1. The following component is unique to the A/P22P-14(V)1 Respirator Assembly (figure 4-25) (Non-oxygen aircraft).

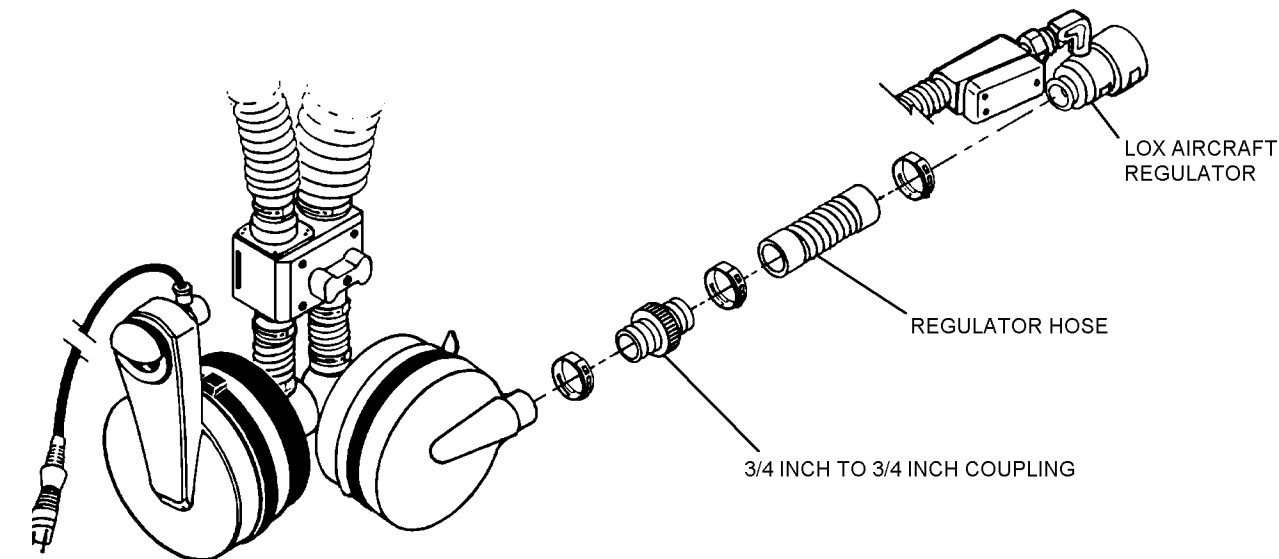


004025

Figure 4-25. Unique (V)1 Components

4-40. H-Manifold Blanking Cap. A blanking cap is installed over the left-side H-manifold inlet port. This port is blanked because the (V)1 Variant does not utilize oxygen. Variants (V)2 thru (V)4 utilize this port for connecting the H-Manifold to the oxygen delivery sub-assembly.

4-41. A/P22P-14(V)2. The following components are unique to the A/P22P-14(V)2 Respirator Assembly (figure 4-26) (LOX aircraft).



004026

Figure 4-26. Unique (V)2 Components

4-42. Coupling. The 3/4 inch - 3/4 inch coupling is a short, cylindrical fitting, manufactured from aluminum. One end of the coupling is connected to the 90° rubber molding and the other end is connected to the regulator hose, with stepless low profile clamps.

4-43. Regulator Hose. The regulator hose is manufactured from ethylene propylene rubber and is corrugated for flexibility. One end of the hose is connected to the 3/4 inch coupling and the other end is connected to a LOX regulator, using stepless low profile clamps.

4-44. A/P22P-14(V)3. The following components are unique to the A/P22P-14(V)3 Respirator Assembly (figure 4-27) (OBOGS aircraft).

4-45. Bayonet Connector. The bayonet connector is a short cylindrical fitting manufactured from aluminum. One end is secured to the 90° rubber molding by a stepless low profile clamp. The other end of the connector has three male pins allowing the connector to be mated to the three J-grooves of an OBOGS oxygen regulator.

4-45A. CBR Elbow. The CBR Elbow is an oxygen rated, 90° elbow. It is connected between the OBOGS oxygen regulator and the aircraft oxygen seat kit hose. The CBR elbow helps route the seat kit hose in an optimum position.

4-45B. Aircraft Oxygen Hose Assembly. The aircraft oxygen hose assembly is used by C-20 and C-40 cockpit crew only to connect the man-mounted regulator to the aircraft's oxygen supply system.

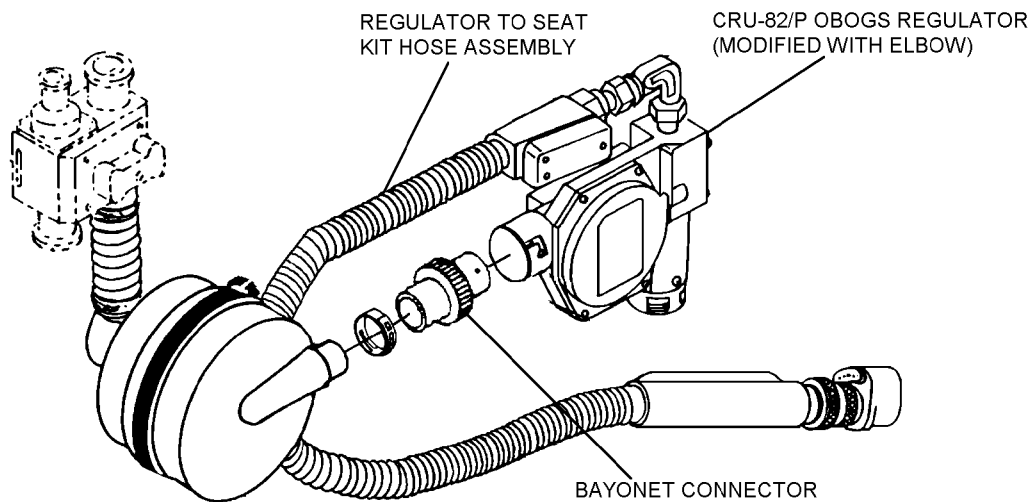


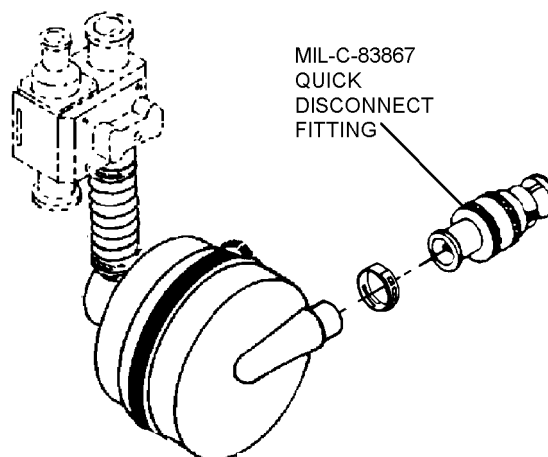
Figure 4-27. Unique (V)3 Components

004027

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4-46. A/P22P-14(V)4. The following component is unique to the A/P22P-14(V)4 Respirator Assembly (figure 4-28) (Panel Mount Regulator Assembly).

4-47. Quick Disconnect Fitting. The quick disconnect fitting is used to connect the oxygen delivery subassembly to the panel mounted oxygen regulator's regulator hose. The smooth, tubular end of the fitting is secured to the 90° rubber molding using a stepless low profile clamp. The other end of the fitting is a spring-loaded two-pin connector with a rubber seal that attaches to the panel mounted regulator hose (Panel Mounted) oxygen delivery subassembly.



004028

Figure 4-28. Unique (V)4 Components

4-47A. Unique Components for Special Applications. The following components are not unique for specific variants, but are unique for special applications.

4-47B. Oxygen Extension Hose Assembly. The 48-inch long oxygen extension hose assembly (figure 4-123) may be used to provide greater mobility and range and to make the connection and use of the emergency walk-around oxygen bottle more convenient. The extension hose connects to the quick disconnect fitting on the panel mounted regulator hose or the fitting on the walk-around bottle.

4-47C. Branched Tubing Connector. A branched tubing connector CRK-90 (figure 4-123A) can be used in lieu of the bayonet connector for special applications. It is not packaged in any of the respirator assemblies. E-2C aircrew will utilize CRK-90 from their existing oxygen mask assembly while C-20 and C-40 crew chiefs are required to obtain by separate means.

4-47D. CB Head Harness. The CB Head Harness (Chapter 8) can be used in lieu of an aircrew helmet as an alternative for mask retention. When there are no other requirements for the aircrew helmet, the CB Head Harness may be used.

4-47E. Cartridge Actuated Cutter. The Cartridge Actuated Cutter (Chapter 7) is intended for use with the A/P22P-14(V)2 or 3 (ejection seat aircrew) during operational contingency missions. It is a battery operated, cartridge actuated device used to provide a breathing air passage for an unconscious aircrewmember forced down over water while wearing an A/P22P-14(V) Chemical Protective Respirator Assembly.

4-48. ADDITIONAL EQUIPMENT. The following components are common to all A/P22P-14(V) Respirator Assemblies.

4-49. CMU-29(V)1/P and (V)2/P Vest. The CMU-29 (V)1/P and (V)2/P vest Configurations, provide a common mounting platform for the lower assembly components for all respirator assembly variants. Current vest configurations can be found in the NAVAIR 13-1-6.7 Series manuals.

4-50. Intercommunications Unit. The intercommunications unit (ICU) (figure 4-30) provides bidirectional communications and is common to all the respirator assemblies presented in this chapter.

NOTE

ARS fitting frames are not supplied with the respirator assembly.

4-51. ARS Fitting Frames. The Aircrew Respirator Spectacle (ARS) fitting frames (figure 4-31) provide a means for fitting aircrew personnel with corrective lenses, and are compatible with the mask. The ARS fitting frames are available in five sizes. Fitting frames with prescription lenses shall be ordered through the Naval Ophthalmic Support and Training Activity (NOSTRA), Yorktown, Virginia. Prescriptions shall be mailed or faxed, utilizing form DD771 (figure 4-29) to NOSTRA, requesting ARS fitting frames. Specify temple length. Contact:

NOSTRA MATERIAL MANAGER
160 Main Rd., Suite 350
Yorktown, VA 23691
Fax DSN: 953-4511
COM: 757-887-4511
Phone DSN: 953-4261
COM: 757-887-4261

EYEWEAR PRESCRIPTION				DATE		ORDER NUMBER	
TO: (Optical Laboratory, including ZIP Code) NOSTRA PO BOX 350 YORKTOWN, VA 23691-0350				FROM: (Station & Location, including ZIP Code)			
NAME (Last, first, middle initial) GRADE AND SERVICE NUMBER/SOCIAL SECURITY ACCOUNT NO.						AGE	
UNIT AND ADDRESS							
<input type="checkbox"/> ACTIVE DUTY <input type="checkbox"/> RETIRED <input type="checkbox"/> OTHER (Specify)		<input type="checkbox"/> USA <input type="checkbox"/> USN <input type="checkbox"/> USAF <input type="checkbox"/> USPHS <input type="checkbox"/> USCG <input type="checkbox"/> OTHER (Specify)					
PRESCRIPTION							
SPECTACLES: <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE		AVIATION SPECTACLES <input type="checkbox"/> N-15 <input type="checkbox"/> COATED <input type="checkbox"/> CLEAR OTHER: <input type="checkbox"/> REPAIR <input type="checkbox"/> PROTECTIVE MASK INSERT (Specify type and position)					
INTERPUPILLARY DIS DISTANCE	NEAR	EYE SIZE	BRIDGE SIZE	TEMPLE LENGTH AND STYLE		NUMBER PAIR(S)	CASE
SINGLE VISION							
	SPHERE	CYLINDER	AXIS	DECEN- TRATION IN OUT	PRISM	BASE	FOR LABORATORY USE ONLY <input type="checkbox"/> STANDARD <input type="checkbox"/> NONSTANDARD <input type="checkbox"/> FINISHED STOCK <input type="checkbox"/> CYLINDER SURFACE <input type="checkbox"/> SPHERE SURFACE <input type="checkbox"/> SINGLE VISION <input type="checkbox"/> BIFOCAL <input type="checkbox"/> TRIFOCA L INT <input type="checkbox"/> TINT <input type="checkbox"/> OTHER
R							
L							
MULTIVISION							
ADD FOR NEAR	MULTIFOCA L INSTRUCTIONS		TOTAL DECENTRATION				
	SEGMENT HT	DECENTRATION NEAR					
R							
L							
SPECIAL LENSES OR FRAME (Details and/or circumstances necessitating prior approval under current instruc- tions and/or regulations. Only identical duplicate prescriptions and components should be ordered on the same DD Form 771.)							
TYPED OR PRINTED NAME, GRADE, TITLE AND SIGNATURE OF APPROVING AUTHORITY							
TYPED OR PRINTED NAME, GRADE, TITLE AND SIGNATURE OF PRESCRIBING OFFICER							
DISTRIBU- TION OF COPIES		CLINIC Originating Prescription - Removes Copy 3 for insertion in patient's Health Record (DD Form 722). Sends Copies 1 and 2 to designated optical laboratory. LABORATORY - Retains Copy 1 for file. Returns Copy 2 with completed spectacles.					

DD FORM 771
1 SEP 68

EDITION OF 1 DEC 66. MAY BE USED.

S/N 0102-LF-007-6202

1

Figure 4-29. ARS Fitting Frames Ordering Form

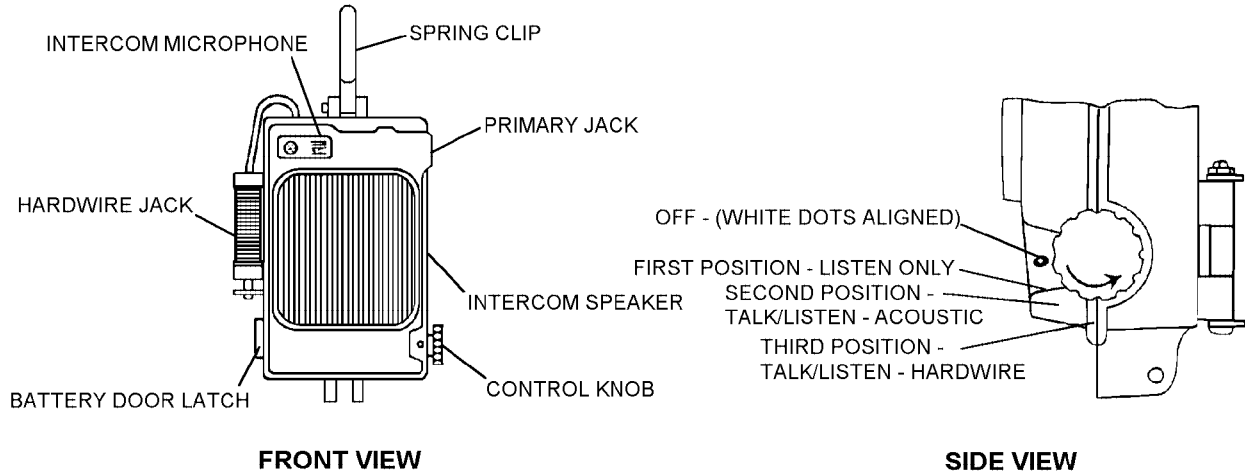


Figure 4-30. Intercommunications Unit

4-30

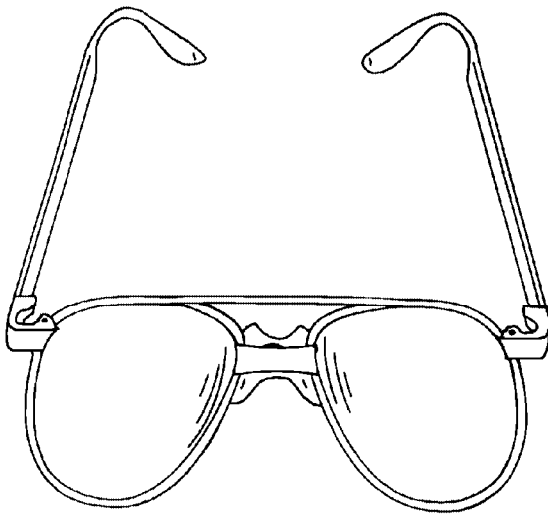


Figure 4-31. ARS Fitting Frames

4-31

NOTE

The canteen cover and M1 cap are not supplied with the respirator assembly.

4-52. Canteen and Cover. A two quart collapsible canteen (NIIN 01-118-8173) and cover (NIIN 01-118-8175), fitted with a shoulder strap (figure 4-32) is connected to the drink facility and provides drinking water to the aircrewmember to prevent dehydration. An M-1 canteen cap (NIIN 00-930-2077) shall be fitted to the canteen.

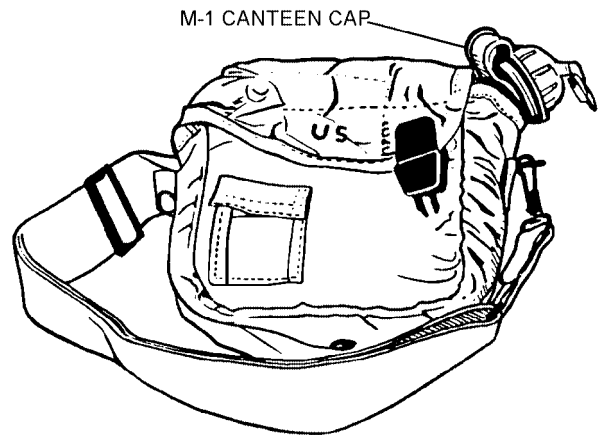


Figure 4-32. Canteen and Cover

4-32

4-53. Transit Case. The transit case, (figure 4-33), which is provided as a means of protection for the mask, seat kit hose and regulator, pusher fan with canister, 90° rubber molding with canister, intercommunication unit, fitting frames, intercom cord, drink facility, optional skullcap, sweatband, or talc powder, during transit or storage is common to all respirator assemblies presented in the chapter.

4-54. Helmet Attachment Kits. The helmet attachment kits (see IPB), include the parts necessary to integrate the respiratory assembly with the aircrew helmet. Procedures for installing these kits are detailed in NAVAIR 13-1-6.7-3.

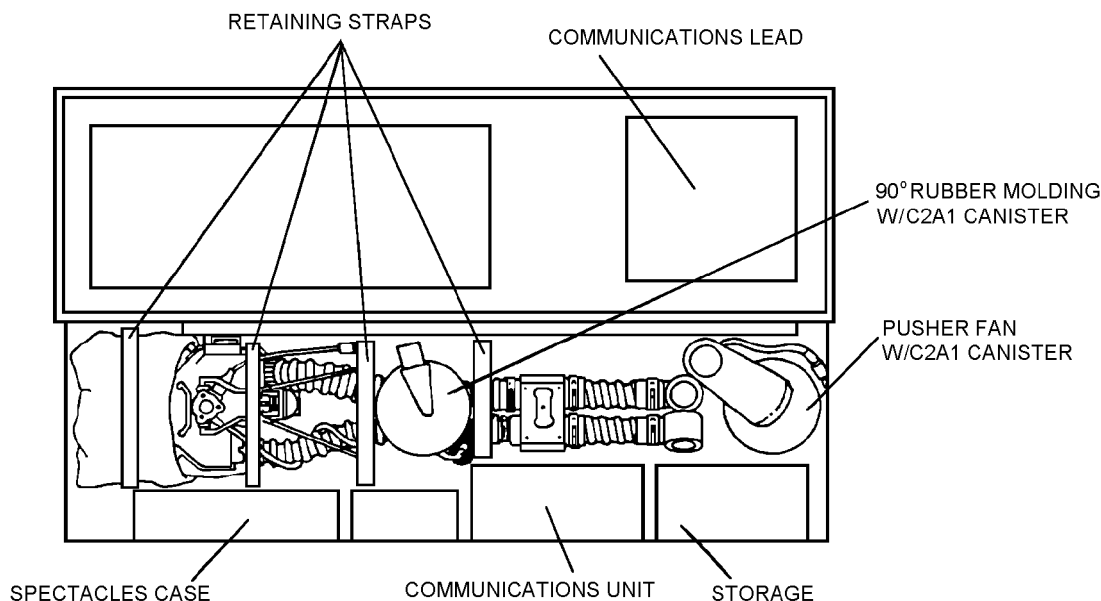


Figure 4-33. Transit Case

004033

4-55. APPLICATION.

4-56. The A/P22P-14(V)1 thru (V)4 Respirator Assembly variants are intended for use by all USN/USMC rotary and fixed wing aircrew personnel for both ground and in-flight operations. A modified HGU series helmet will be worn over the mask to provide head protection in-flight. Refer to NAVAIR 13-1-6.7-3 for applicable helmets.

4-57. A/P22P-14(V)1. The (V)1 variant is intended for use by all rotary wing aircrew. This variant is similar to the MCK-3A/P Mask (Rotary Upgrade Mask) that is utilized by USMC helicopter aircrews. The (V)1 variant is a non-oxygen system and is suitable in the following aircraft: AH-1W, UH-1N, HH-1N, SH-3H, UH-3A, CH-46D/E, HH-46D, UH-46D, CH-53D/E, MH-53, RH-53D, SH-60B/F, and HH-60H.

4-58. A/P22P-14(V)2. The (V)2 variant is intended for use by all fixed wing aircrew utilizing Liquid Oxygen (LOX) Systems. The (V)2 variant is suitable for the following aircraft: F-14A/B, F/A-18A/B, S-3B, ES-3A, US-3A, A-4M, and EA-6B.

4-59. A/P22P-14(V)3. The (V)3 variant is intended for use by all fixed wing aircrew utilizing Molecular Sieve Oxygen Generating Systems (MSOGS) or On-Board Oxygen Generating Systems (OBOGS). The (V)3 variant is suitable for the following aircraft: AV-8B, TAV-8B, F-14D, and F/A-18C/D/E/F, C-20 pilot and co-pilot, and C-40 pilot and co-pilot. C-20 and C-40 crew chiefs will use a build-to (V)3 configuration (figure 4-123A). See Chapter 2 for Long Term Storage of CRU-103 for C-20/C-40 Aircrew.

4-60. A/P22P-14(V)4. The (V)4 variant is intended for use by all fixed wing aircrew utilizing Panel Mounted Oxygen Systems. The (V)4 variant is suitable for the following aircraft: C-2A, E-2C, P-3C, EP-3E/J, UP-3A/B, KC-130F/R/T, C-130F/T, E-6A, C-9, C-20 aft crew, and C-40 aft crew.

4-61. FUNCTION AND OPERATION.

4-62. NORMAL OPERATION.

4-63. Mask. The inside of the mask is divided into two compartments (figure 4-34 and figure 4-35). The mask compartment is made up of the orinatal area within the orinatal mask and the hood compartment comprises remaining area. This configuration provides for separate breathing and ventilation areas and allows pressurized oxygen supply ((V)2 through (V)4 only) to the orinatal mask reducing the breathing effort required. The air supply to the hood maintains a positive pressure which prevents contaminants from entering and reduces wearer heat stress even in hot and humid conditions, while providing faceplate defogging.

4-64. Mask Compartment. Filtered air or oxygen enters the mask compartment via the mask inlet hose, mask inlet adapter and the inhalation valve. Upon exhalation, the orinatal mask inhalation valve closes, forcing the exhaled gases from the orinatal mask and into the outlet housing chamber via the compensated exhalation valve. While the pressure in the outlet housing chamber is greater than the air pressure outside the mask, the gases are expelled through the exhalation valve and into the environment. The exhalation valve closes when pressure in the exhalation duct is equal to,

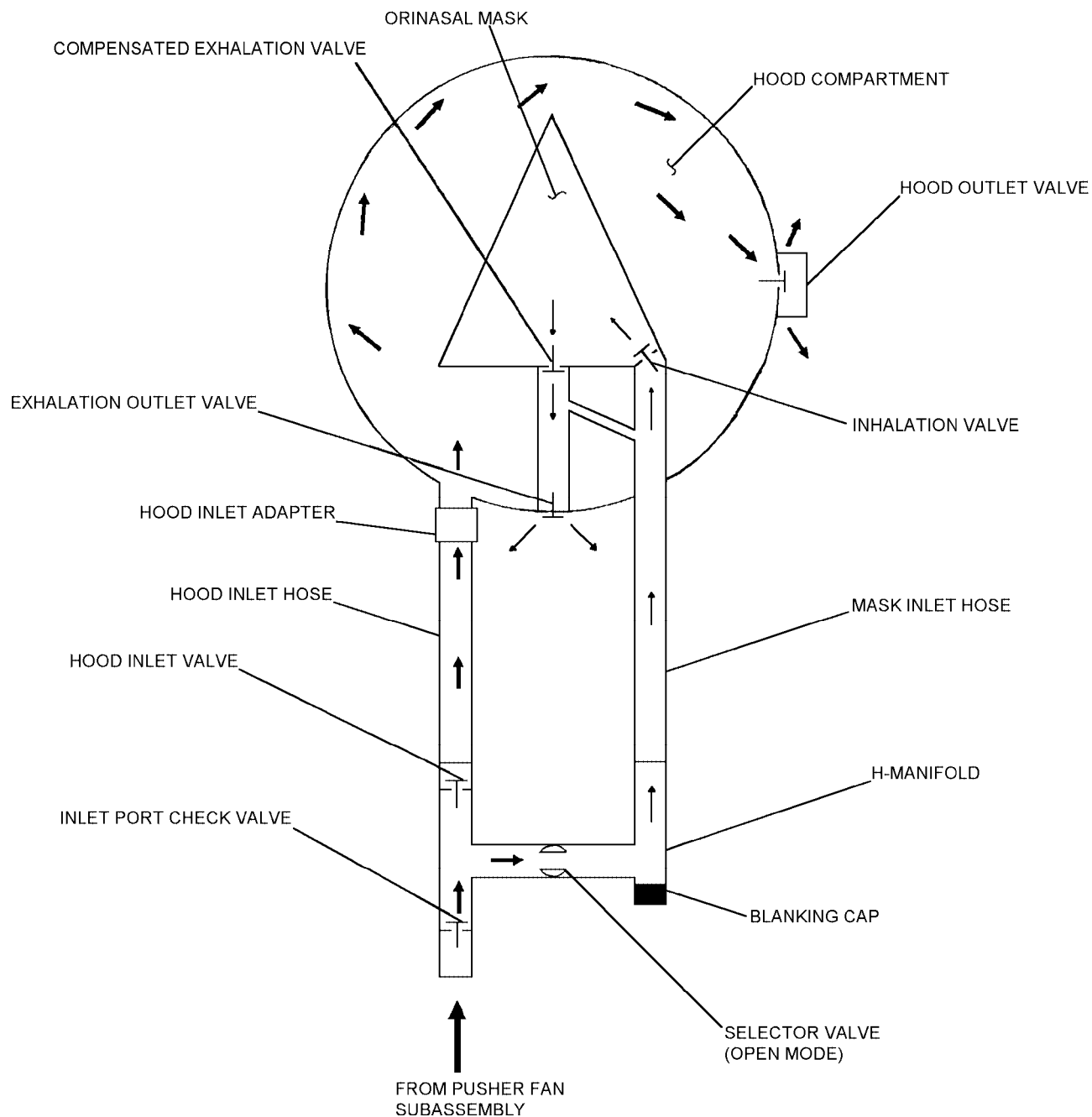


Figure 4-34. Filtered Air Flow to Orinasal Mask and Hood Compartment - (V)1 Only

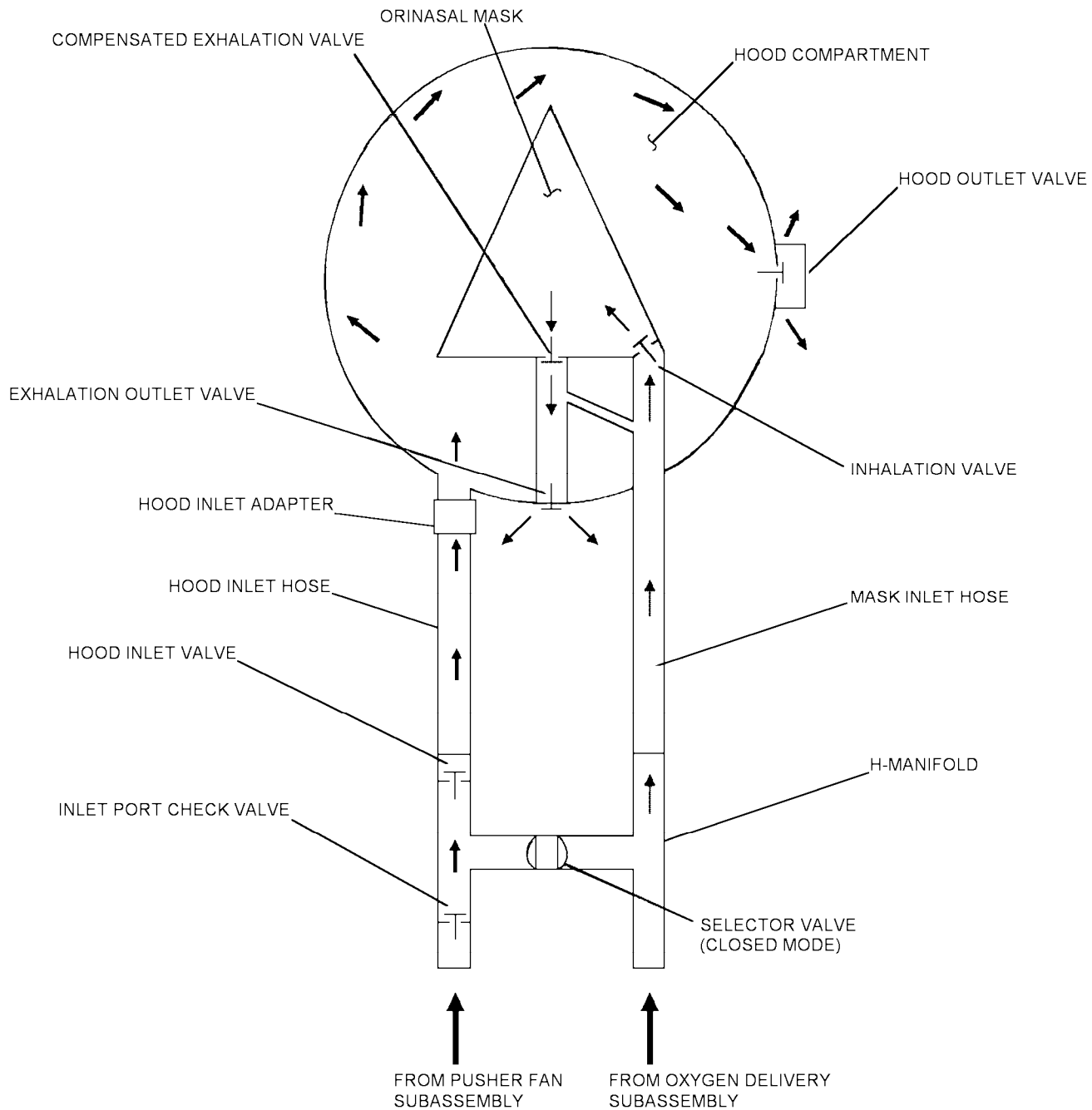


Figure 4-35. Filtered Air Flow to Hood Compartment and Filtered Oxygen to Orinasal Mask - (V)2 thru (V)4 Only

4-35

or less than, the pressure in the outlet housing chamber. As the wearer breathes, this inhalation and exhalation sequence becomes cyclical.

4-65. Nose Occluder. The nose occluder, incorporated into the faceplate, permits the aircrewmember to equalize pressure during flight. When properly fitted, raising the occluder stirrup on the outside of the faceplate rotates the rollers, located between the faceplate and the orinasa mask, down over the orinasa mask. This should pinch the nose closed, facilitating the valsalva maneuver, enabling the aircrewmember to clear their ears. Butyl rubber blanking plugs installed in the faceplate nose occluder bushings shall not be removed unless a nose occluder is being installed. Protection against chemical agents will not be degraded if the plugs are properly installed and remain fully seated.

4-66. Hood Compartment. Filtered air enters the hood compartment via the hood inlet hose, through the hood inlet adapter and is directed across the wearer's face and the visual portion of the faceplate to prevent fogging or frosting of the visual area. Air exits the hood compartment through the hood outlet valve. The hood outlet valve can be closed in the event the pusher fan fails ([figure 4-36](#)). To close, pull and twist clockwise. Allow the disc to close on the stepped rubber valve. To open, pull and twist counterclockwise. This feature prevents any toxic agent or contaminant from entering the hood compartment of the respirator. When closed, the hood outlet valve prevents water from entering the hood compartment, while the aircrewmember is seated in the upright position, on emergency immersion into water.

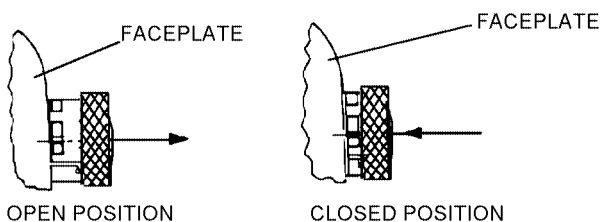


Figure 4-36. Hood Outlet Valve Operation

4-36

4-67. Drink Facility. The drink facility assembly allows the ingestion of liquids from a two quart collapsible canteen while wearing the CBR protective assembly. The drink facility may be used on the ground or in flight in both liquid and vapor CB contaminated environments.

1. Connection and use of the drink facility ([figure 4-37](#)).

a. In a CB contaminant free ready room remove drink facility quick disconnect from drink facility holder.

b. Open canteen connector flap.

c. Connect drink facility quick disconnect to canteen cap.

d. To drink, squeeze canteen hard with both hands, against chest or under arm, or hold canteen upside down over head.

e. Pause and blow into canteen periodically to avoid canteen collapsing.

2. Disconnecting drink facility. It is mandatory that drink facility not be disconnected until doffing the entire ensemble in a clean or decontaminated area. However, if the drink facility needs to be removed, proceed as follows:

WARNING

If canteen is disconnected in a CB contaminated environment, do not reconnect until all matching connectors are free of CB contamination.

a. Disconnect drink facility from canteen by pulling and twisting connector valve. Close canteen cap flap.

b. Secure free end of drink facility by inserting it into drink facility holder mounted on hood inlet hose.

c. Unhook canteen from straps. Connect straps together to facilitate finding them later.

d. Properly stow canteen.

4-68. Microphone Assembly. The microphone assembly allows the aircrewmember to communicate while wearing the mask during flight and on-ground (see [figure 4-17](#) for ground and in-flight connections).

4-69. Toggle Harness Assembly. The toggle harness assembly provides the proper retention necessary for securing the mask to a protective helmet. Tension adjustments are made by rotating the swivel links. Additional tension can be provided by flipping the toggle plate in the most downward position (see [figure 4-16](#)).

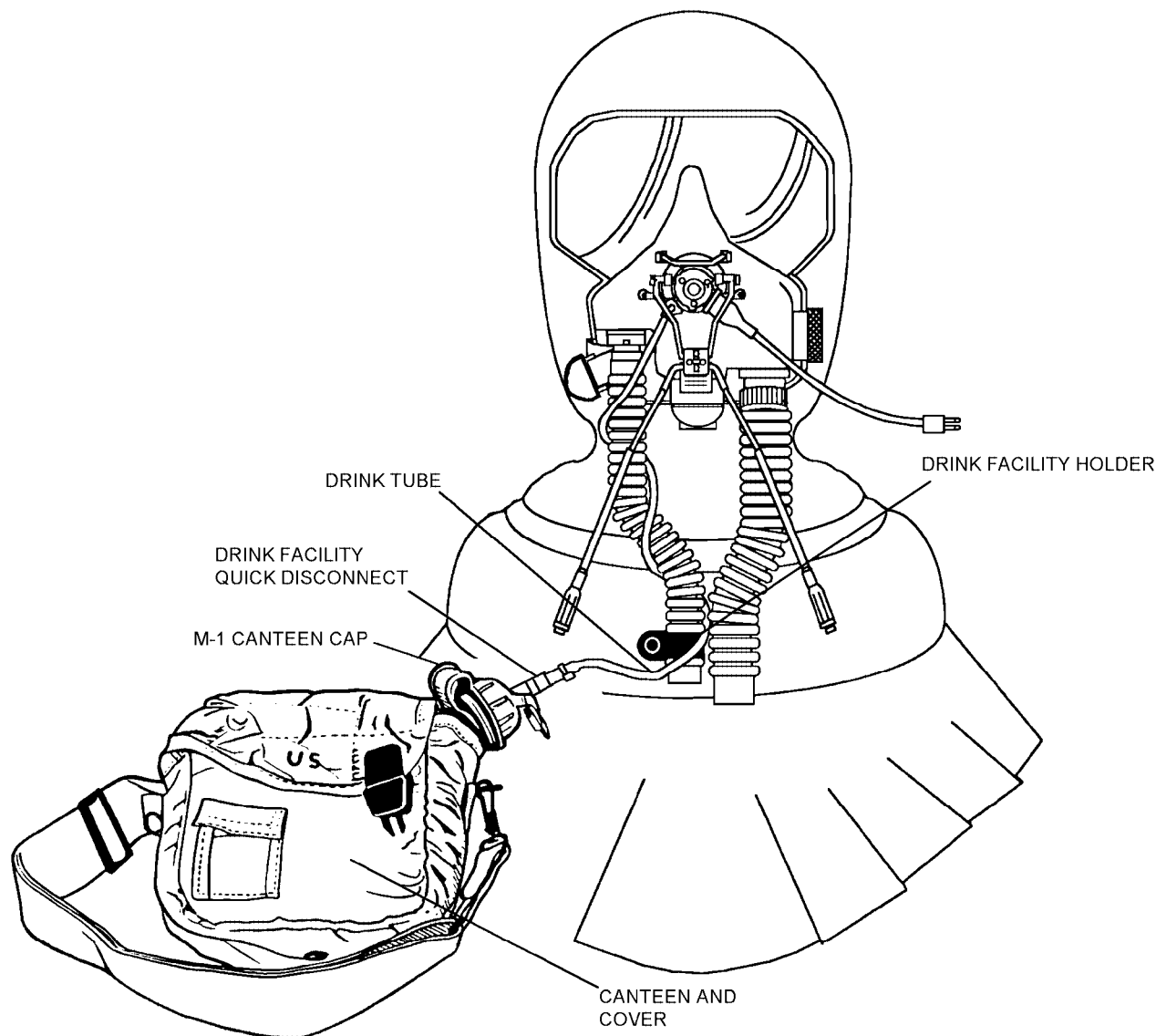


Figure 4-37. Drink Facility Connection to Canteen

4-37

4-70. Lower Assembly. The (V)1 variant lower assembly provides the aircrewmember with filtered air for both the hood compartment and orinal mask ([figure 4-34](#)). The (V)2 through (V)4 variant lower assembly provides the aircrewmember with filtered air to the hood compartment and filtered, pressurized oxygen to the orinal mask ([figure 4-35](#)).

4-71. H-Manifold. H-Manifold settings for various modes are shown in [figure 4-38](#).

4-72. Pusher Fan Subassembly. The pusher fan subassembly ([figure 4-22](#)) is common to all respirator assembly variants and provides filtered air for the hood compartment. The battery operated pusher fan forces ambient air through a C2 or C2A1 canister and into the

right inlet port hose, leading to the H-manifold. This low pressure air then flows through the hood inlet hose and into the hood compartment, providing positive pressure to prevent CB contaminants from entering. The C2 or C2A1 canisters are standard issue NATO charcoal filters that act as a protective barrier against CB agents. The pusher fan battery is a dc voltage NiCad rechargeable battery (which allows the pusher fan to operate for 3 1/2 to 4 hours of continuous use) or a non-rechargeable Lithium Battery (capable of providing 10 hours of continuous use). The battery power is turned ON by pressing the rubber boot covered ON/OFF switch on top of the battery opposite the pusher fan battery terminal cable (see [Chapter 6](#) for battery operation).

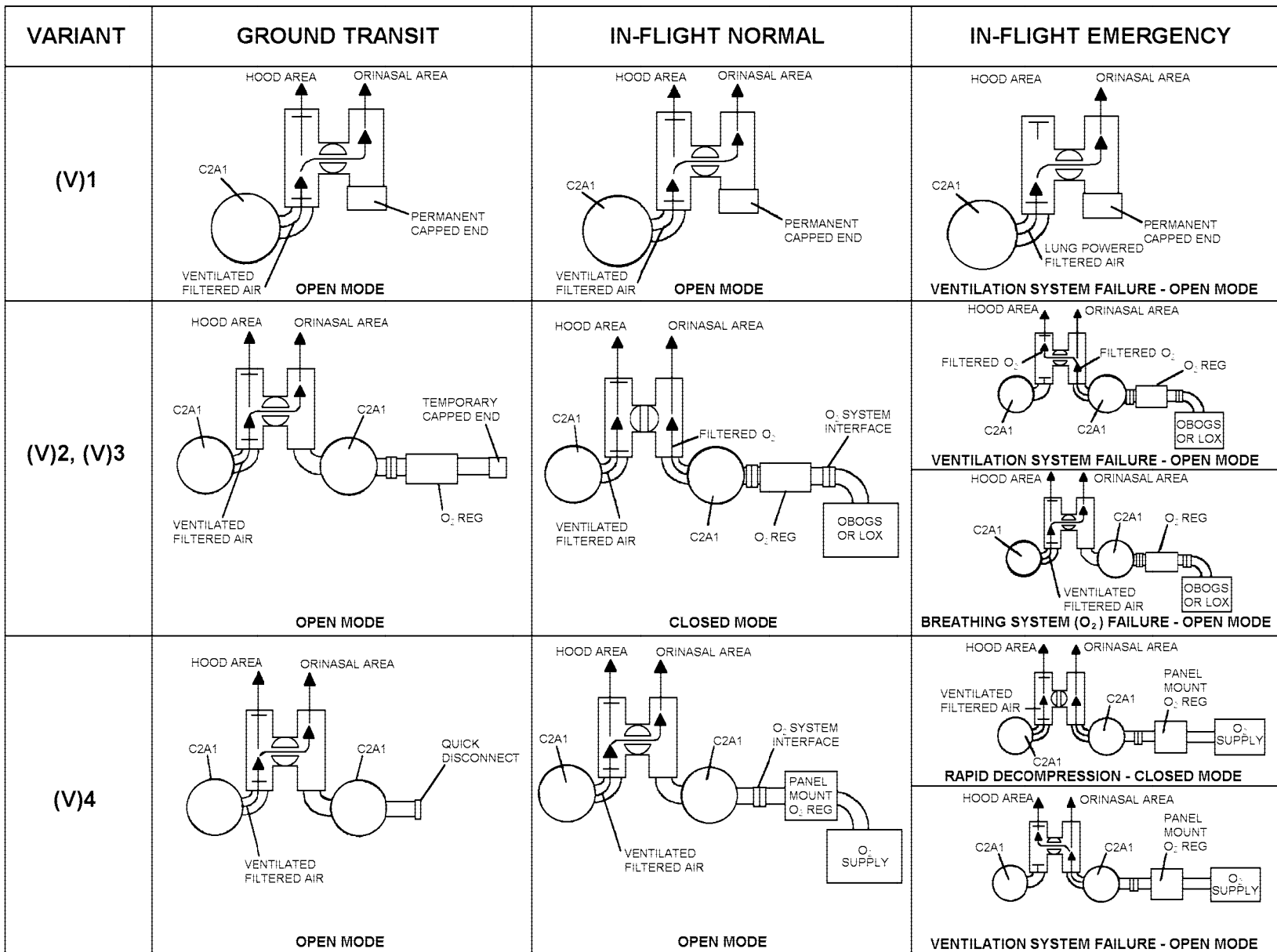


Figure 4-38. H-Manifold Flow Selection

4-73. Oxygen Delivery Subassembly. The oxygen delivery subassembly (figures 4-26 through 4-28) is applicable to the (V)2 through (V)4 variants only and provides, on demand, pressurized oxygen supply to the orinasal mask. Supplied from an oxygen regulator, oxygen travels through the C2 or C2A1 canister to the J-manifold, which is connected to the H-manifold by the left side H-manifold hose. Oxygen is passed from the H-manifold to the orinasal mask via the mask inlet hose, providing a breathable oxygen supply, free of contaminants.

4-74. Intercommunication Unit (ICU). The ICU (figure 4-30) allows communications with another person via the second jack socket, directly connected to that person's own intercom set. Also, by means of the transducer, communication can be established with any person not equipped with an intercom. Operation of the ICU is as follows:

1. When the white dots are aligned - Off - the intercom is off.
2. In the first position - Listen Only - communications are received via the intercom microphone.
3. In the second position - Talk/Listen - Acoustic - communications are transmitted and received via the intercom speaker and microphone.
4. In the third position - Talk/Listen - Hardwire - communications are received and transmitted via hardwire (when another crewmember electrical branch cord is plugged into hardwire jack) between crewmembers. This function bypasses the intercom microphone and speaker.

4-75. EMERGENCY OPERATION.

4-76. Respirator Assembly. The A/P22P-14(V)1 through (V)4 Respirator Assemblies provide two methods to prevent suffocation, and for obtaining access to unfiltered ambient air. Either the anti-suffocation disconnect can be disconnected or the faceplate ripaway feature utilized (see procedures below). Detailed information concerning these procedures, as well as for emergency egress over water are contained in the aircraft NATOPS Emergency Procedures section.

4-77. Anti-Suffocation Disconnect.

1. Grasp connector with left hand (if possible)
2. Twist inward toward faceplate one-quarter turn, shearing the brass shear screw, and unlocking the connector.
3. Pull away to uncouple the connector.
4. The anti-suffocation disconnect may then be reattached later allowing the user to again breathe filtered air.

4-78. Faceplate Ripaway Toggle (figure 4-39).

NOTE

Once removed, the faceplate may not be reattached, but the microphone inside the faceplate may still be used.

Prior to using ripaway procedure, visor and any other helmet mounted equipment must be raised or removed.

1. Locate ripaway toggle and grasp D-ring with right hand.
2. Pull D-ring until hood rips and D-ring ribbon separates from hood.
3. Unsnap CBR adapter straps.
4. Place fingers in slit and rip faceplate away from face with left hand.

4-79. REFERENCE NUMBERS, ITEMS, AND SUPPLY DATA.

4-80. ILLUSTRATED PARTS BREAKDOWN. Section 4-5 lists and illustrates only components of the respirator assembly that are replaceable. Figure and index numbers and reference or part numbers are provided for identification and procurement of replacement components. Source, Maintenance, and Recoverability codes are provided for procurable items.

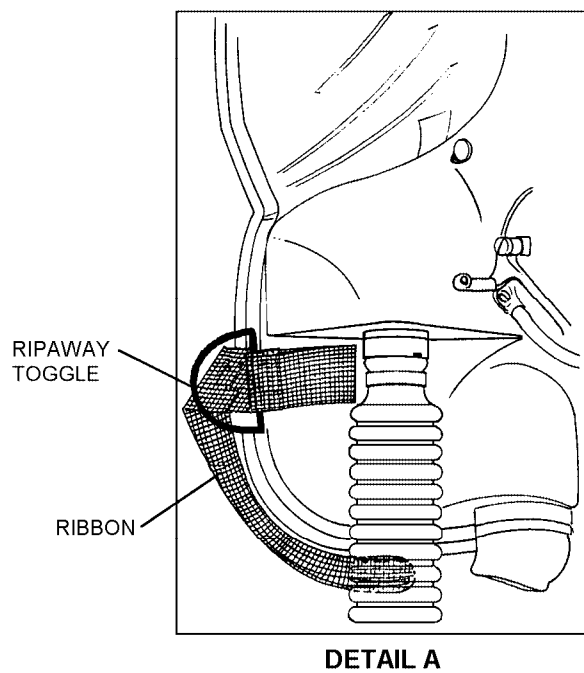
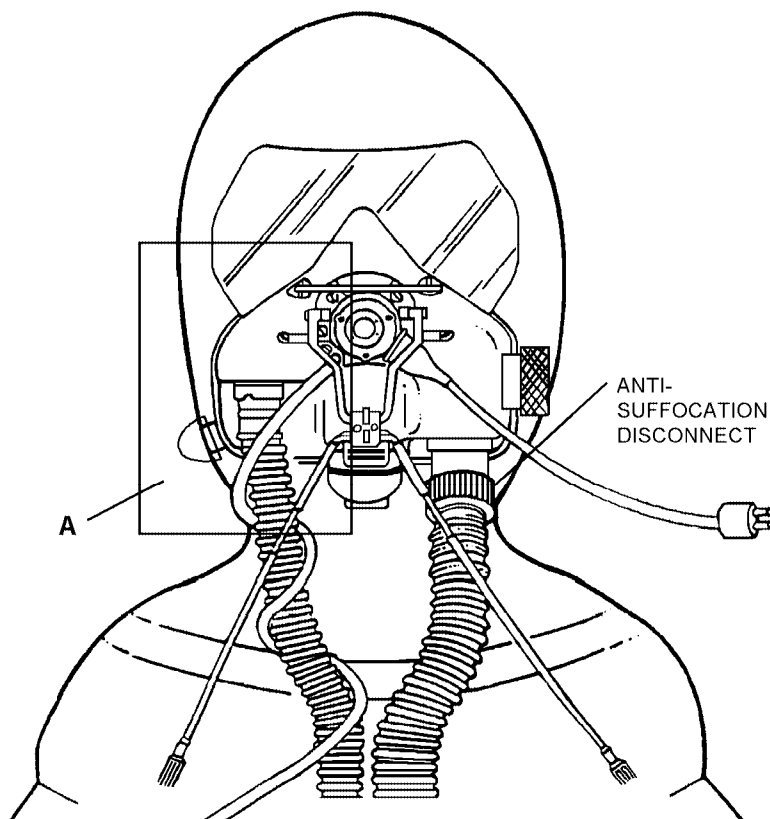
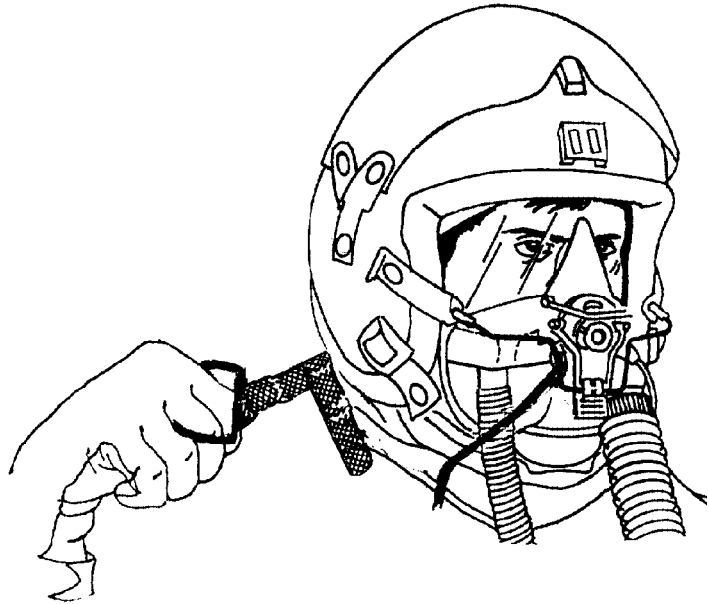


Figure 4-39. Emergency Ripaway Toggle



STEP 1. LOCATE RIPAWAY TOGGLE AND GRASP D-RING WITH RIGHT HAND.



STEP 2. PULL TOGGLE UNTIL HOOD RIPS AND D-RING RIBBON SEPARATES FROM HOOD.



STEP 3. UNSNAP CBR ADAPTER STRAPS.



STEP 4. PLACE FINGERS IN SLIT AND RIP FACEPLATE AWAY FROM FACE WITH LEFT HAND.

Figure 4-40. Anti-Suffocation Ripaway Procedures

4-40

Section 4-2. Modifications

4-81. GENERAL.

4-82. Each Respirator Assembly variant may be modified/converted into any other variant. The efforts required to change from one variant to another are summarized in figure 4-41. No special tools are required for this operation, other than the low profile pincer tool which is necessary to release and refasten

the low profile clamps securing the manifold hoses. Detailed instructions for assembling or disassembling components can be found in the appropriate assembly/disassembly section of this manual.

4-82A. The A/P22P-14(V) Series Respirator Assembly shall be upgraded by comparing the configuration of the assembly with the modifications listed in table 4-1A.

Table 4-1A. Respirator Assembly Directives

Description of Modification	Application	Modification Code
Incorporation of Cartridge Actuated Cutter (PASD)	Respirator Assemblies A/P22P-14(V)2 and (V)3	66-678

To Convert	To Variant:			
From Variant:	(V)1 Non-oxygen	(V)2 LOX	(V)3 OBOGS	(V)4 Panel Mount
(V)1 Non-oxygen		<ul style="list-style-type: none"> - Re-orient pusher fan as shown in figure 4-2. - Remove blanking cap from H-manifold port. - Install oxygen delivery subassembly (figure 4-24). - Install 3/4 to 3/4 inch connector, regulator hose and regulator (figure 4-26). 	<ul style="list-style-type: none"> - Re-orient pusher fan as shown in figure 4-2. - Remove blanking cap from H-manifold port. - Install oxygen delivery subassembly (figure 4-24). - Install bayonet connector and regulator (figure 4-27) 	<ul style="list-style-type: none"> - Re-orient pusher fan as shown in figure 4-2 - Remove blanking cap from H-manifold port - Install oxygen delivery subassembly (figure 4-24) - Install quick disconnect (figure 4-28)
(V2) LOX	<ul style="list-style-type: none"> - Remove oxygen delivery subassembly (figure 4-24). - Cap H-manifold port (figure 4-1) - Re-orient pusher fan as shown in figure 4-1 		<ul style="list-style-type: none"> - Remove regulator hose and 3/4 to 3/4 inch connector - Install bayonet connector and regulator (figure 4-27) 	<ul style="list-style-type: none"> - Remove regulator hose and 3/4 to 3/4 inch connector - Install quick disconnect (figure 4-28)
(V)3 OBOGS	<ul style="list-style-type: none"> - Remove oxygen delivery subassembly (figure 4-24) - Cap H-manifold port (figure 4-25) - Re-orient pusher fan as shown in figure 4-1 	<ul style="list-style-type: none"> - Remove bayonet connector and regulator - Install 3/4 to 3/4 inch connector, regulator hose, and regulator (figure 4-26) 		<ul style="list-style-type: none"> - Remove bayonet connector and regulator - Install quick disconnect (figure 4-28)
(V)4 Panel Mount	<ul style="list-style-type: none"> - Remove oxygen delivery subassembly (figure 4-24) - Cap H-manifold port (figure 4-25) - Re-orient pusher fan as shown in figure 4-1 	<ul style="list-style-type: none"> - Remove quick disconnect - Install 3/4 to 3/4 inch connector, regulator hose, and regulator (figure 4-26) 	<ul style="list-style-type: none"> - Remove quick disconnect - Install bayonet connector and regulator (figure 4-27) 	

Figure 4-41. Variant Conversion Matrix

Section 4-3. Fitting

4-83. GENERAL.

4-84. The concept of fitting refers to and encompasses sizing, initial preparation of components, fitting and adjustment. The procedures contained in this section shall be performed at the designated organizational maintenance level by a qualified Aircrew Survival Equipmentman (PR).

4-85. SIZING.

4-86. Procedures are provided in this section to fit the wearer with the proper orinasal mask, hood and nose occluder.

4-87. PREPARATION OF COMPONENTS AND PROCEDURAL STEPS.

NOTE

To make up a complete assembly, the appropriate mask assembly and appropriate nose occluder kit must be individually requisitioned (see materials required).

Materials Required

Quantity	Description	Reference Number
As Required	Lubricant, KRYTOX, Type II, 240AC	NIIN 00-961-8995
1	Respirator Assembly (Large Orinasal Mask)-any Applicable Variant	CL 6361, CL 6366, CL 6371, or CL 6376
1	Respirator Assembly (Small Orinasal Mask)-any Applicable Variant	CL 6362, CL 6367, CL 6372, or CL 6377

Materials Required (Cont)

Quantity	Description	Reference Number
1	Kit, Nose Occluder, 4 mm long	CL 6564
1	Kit, Nose Occluder, 5 mm long	CL 6565
1	Kit, Nose Occluder, 6 mm long	CL 6566
1	Kit, Nose Occluder, 7 mm long	CL 6567
1	Kit, Nose Occluder, 4 mm short	CL 6568
1	Kit, Nose Occluder, 5 mm short	CL 6569
1	Kit, Nose Occluder, 6 mm short	CL 6570
1	Kit, Nose Occluder, 7 mm short	CL 6571

Support Equipment Required

Quantity	Description	Reference Number
1	Screwdriver, Jeweler's head	—
1	Nut Driver, 1/8 inch	—

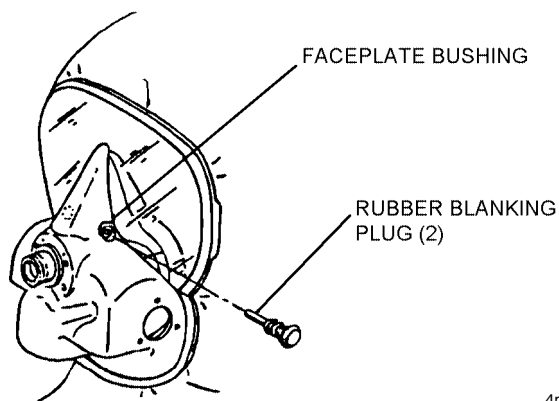
4-88. INITIAL SIZING, FITTING AND ADJUSTMENT.

4-89. Mask Preparation. Preparation for fitting and use of the mask shall proceed as follows:

1. Selection of proper mask size will be a subjective procedure to determine the proper fit to the wearer.
2. Initially choose a large mask for larger aircrew or small mask for smaller aircrew. Use marking numbers located on packaging container and on inside of mask apron to identify proper size.
3. Remove selected mask from the transit case.
4. Remove all packaging materials and coverings from mask. Ensure hoses, exhalation outlet valve, and hood outlet valve are free from obstruction. Ensure rubber blanking plugs are properly installed in masks not incorporating the nose occluder kit.
5. If nose occluder is to be installed, remove rubber blanking plugs from nose occluder faceplate bushing in mask faceplate.

NOTE

Retain blanking plugs for future use in masks in which previously installed nose occluder is not required and is removed.



Step 5 - Para 4-89

4p89s5

4-90. Orinasal Mask Sizing.

1. Invert hood to expose the orinasal mask (see [figure 4-81](#)).
2. Instruct subject to hold orinasal mask to the face in its normal position with firm pressure. If

installed, remove pusher fan filter and/or the 90° rubber molding. Cover J-manifold ends with the palm of the hand to prevent the intake of air, and have subject attempt to inhale deeply to test seal of orinasal mask to the face. If leakage is evident around orinasal mask edge, switch to a larger or smaller size orinasal mask and retest.

3. Once subject is satisfied with orinasal mask-to-face sealing, proceed with hood sizing.

4-91. Hood Sizing. Once the subject is satisfied with the orinasal mask fitting, perform the following:

1. Re-invert hood.
2. Have subject don skull cap and/or headband if so desired. These items are recommended to improve comfort and to keep perspiration out of the eyes.
3. Turn pusher fan on. Ensure H-manifold selector knob is in the open position (horizontal) and the Hood Outlet Valve is open.



Subject shall be careful not to tear neck seal when donning mask.

4. Holding skull cap in place, instruct subject to place hands inside the neck seal with palms together and pull open. Slide down over head. Adjust mask for orinasal mask comfort and good visibility.
5. Assist the subject in seating the mask neck seal, ensuring neck seal is not rolled up and lies flat.
6. The Hood should fit snugly around the head without causing any discomfort. The orinasal mask may hang slightly away from the face, but should not press unduly into the face.

NOTE

Although the mask is available in five sizes, (see [table 4-1](#)) only the S and L overall size is readily available. Custom fit sizes: XL, XS, and XXS are only available by contacting:

Naval Air Warfare Center, Aircraft Division
Code 4.6.3.1
Patuxent River, MD 20670-1906
DSN (301) 342-8850

7. Have the subject check step 6 and move head up and down. Check to see that the neck seal seats snugly, does not slide, or have any gaps around the neck when checking step 6. Turn pusher fan off and repeat step 7.

8. If the mask fits too tightly, around the head and causes discomfort around the orinasal mask to face seal, request an XL size. If the mask fits too loose and the hood has extra baggy material around the head, request an XS size. If a small aviator, with very narrow neck, has difficulty making a good neck seal or the neck seal slides when moving head up/down or checking step 6, request an XXS size.

9. Once the subject is satisfied with the orinasal mask face sealing and hood sizing, turn pusher fan off, doff mask and proceed with nose occluder fitting.

4.92. Initial Fitting of Nose Occluder. Table 4-2 provides the most practical method of selecting the proper nose occluder kit to fit the individual wearer. The table lists available nose occluder kits, their dimensions, and the proportion of aircrew using the individual kits. (For example, 75% of aircrew personnel requiring installation of a nose occluder use P/N CL 6566). Begin initial fitting process by using kit P/N CL 6566, since that kit is most commonly used. Each kit should contain the following.

Item Part	Quantity
Shaft Assembly	2
O-ring	4
Stirrup Assembly	1
C-clip	2
Facing Washer	2

CAUTION

When assembling nose occluder into mask, care should be taken not to force any parts together. Nose occluder and faceplate bushings which are in good working order should fit together snugly but easily. The bushings are black coated brass inserts which are press fitted into the faceplate and sealed with a silicone rubber sealant. Using excessive pressure could dislodge nose occluder faceplate bushings.

NOTE

It is suggested that prior to assembling nose occluder in mask, shaft assemblies and stirrup be engaged several times to remove any excess coating on the splines. If splines do not engage smoothly after this, they may be out of specification and should be replaced. Use Krytox sparingly to ensure that the shaft assembly splines will properly fit into the stirrup splines without excessive force.

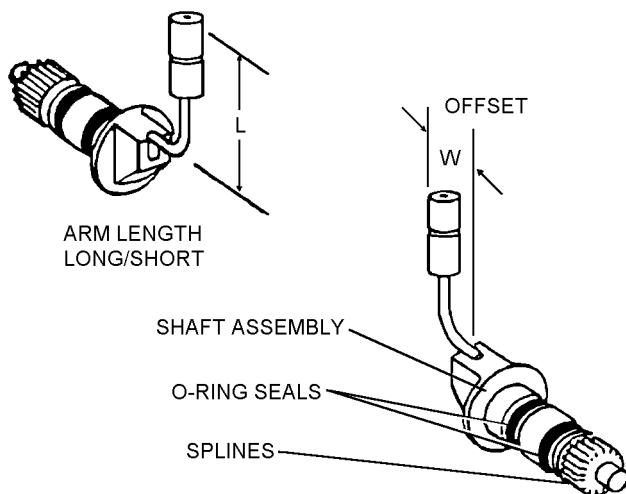
There are no published repair procedures for either spline interference or faceplate bushings at this time. During assembly, ventilate mask with a pusher fan whenever hand is inside mask to prevent hand sweating and visor fogging. Assembly will be easier if hands are dry.

1. After selecting proper nose occluder kit, before assembling nose occluder to stirrup assembly, apply Krytox lubricant to splined ends of nose occluder shaft assemblies. Work splines of both shaft assemblies in and out of stirrup assembly splines several times until the male splines engage smoothly with the female splines.

Table 4-2. Nose Occluder Assembly

BOTTOM ROLLER COLOR A	NOSE OCCLUDER KIT	ARM LENGTH LONG OR SHORT	WIDTH	% USED
Brown	CL 6564	L	4 mm	1%
Red	CL 6565	L	5 mm	5%
Orange	CL 6566	L	6 mm	75%
Deep Cream	CL 6567	L	7 mm	5%
Green	CL 6568	S	4 mm	1%
Blue	CL 6569	S	5 mm	7%
Violet	CL 6570	S	6 mm	5%
Grey	CL 6571	S	7 mm	1%

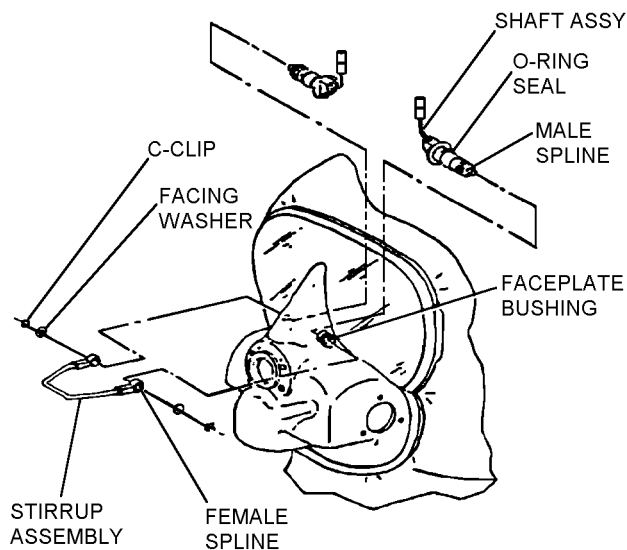
2. Inspect and lightly lubricate the two O-ring seals on shaft assemblies.



Steps 1 and 2 - Para 4-92

4p92s1

3. Insert one shaft assembly through inside of faceplate bushing. Position roller portion of shaft assembly flush against inner side of faceplate nose bridge and then engage the splines. Repeat for opposite shaft assembly.

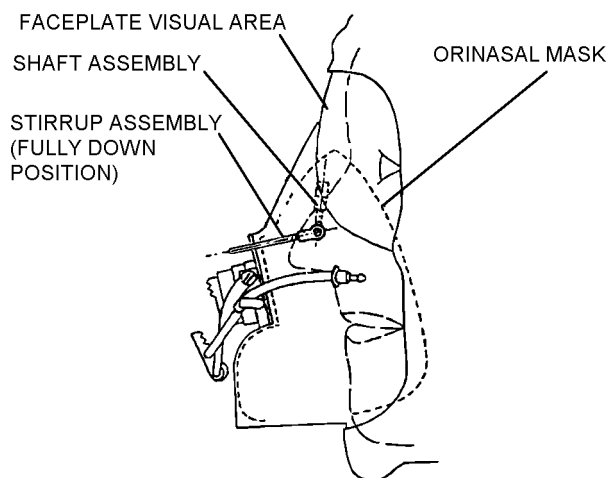


Step 3 - Para 4-92

4p92s3

4. Position stirrup assembly to be fully down onto outer portion of the faceplate.

5. Maintain relative positions of the shaft assemblies and stirrup, then ease shaft assemblies through faceplate bushing to engage splines of stirrup.



Steps 4 and 5 - Para 4-92

4p92s4

NOTE

Do not install washers or C-clips to stirrup assembly until [paragraph 4-100](#).

6. With hood still inverted, instruct subject to hold orinasal mask firmly to the face, simulating its normal position. Have subject raise stirrup assembly and valsalva by trying to expel air through the nose. Check for smoothness of operation, and ensure stirrup travel limits roller movement and not vice versa following the flow diagram shown in [figure 4-42](#). If proper function is achieved, the subject is suitably valsalvas with no air leakage through the nose, proceed with [paragraph 4-93](#). If proper function is not achieved, proceed with the following [step 7](#).

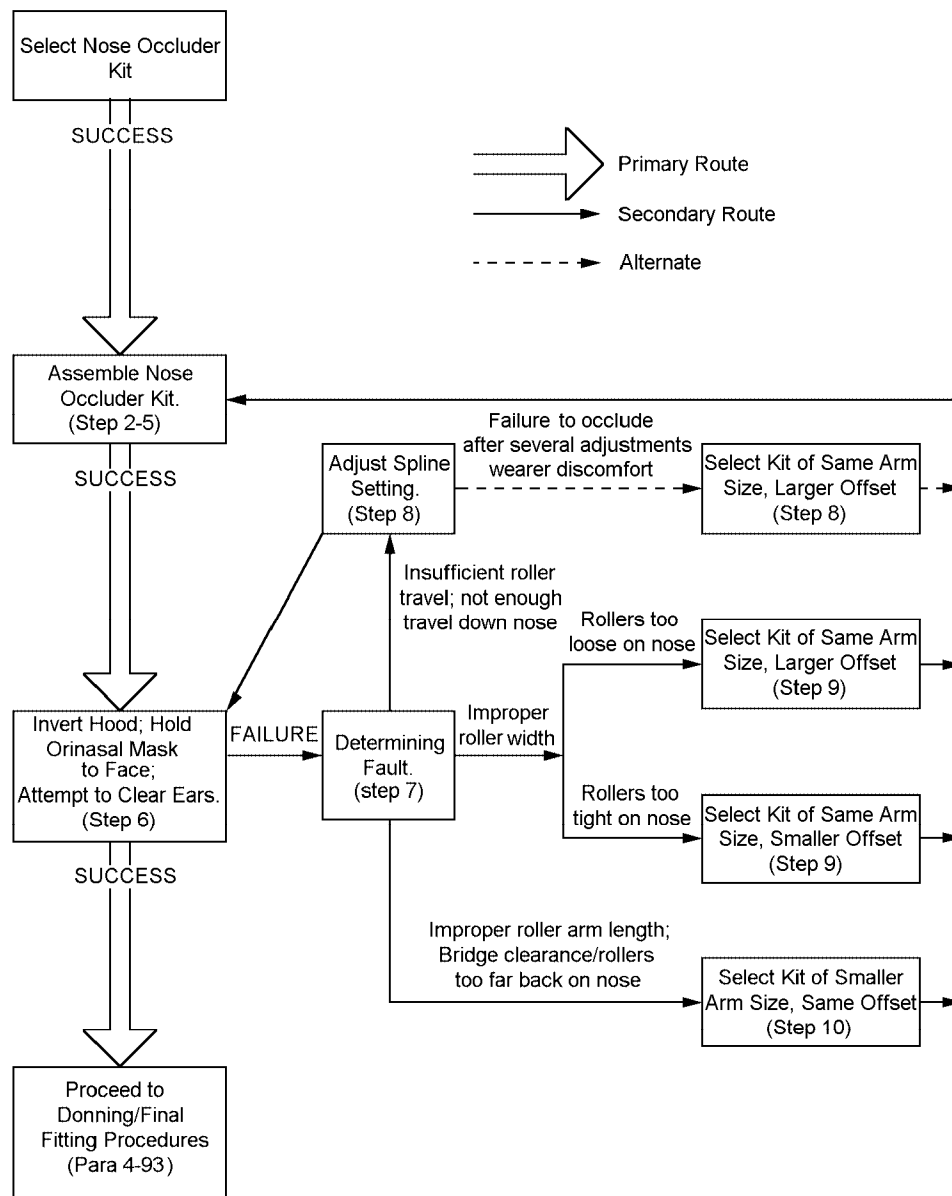
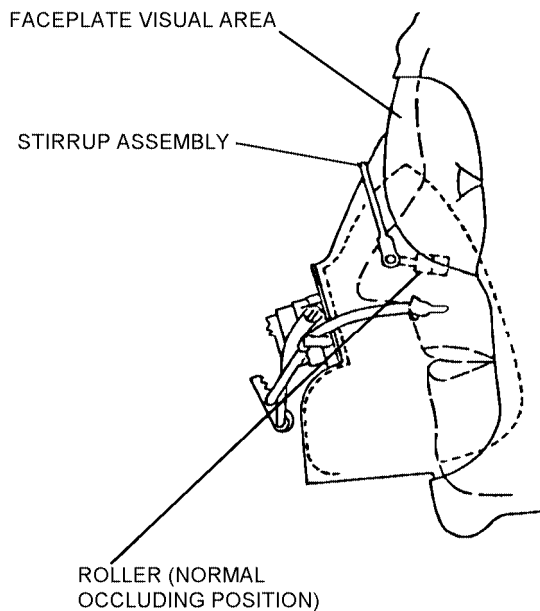


Figure 4-42. Nose Occluder Fitting Flow Diagram

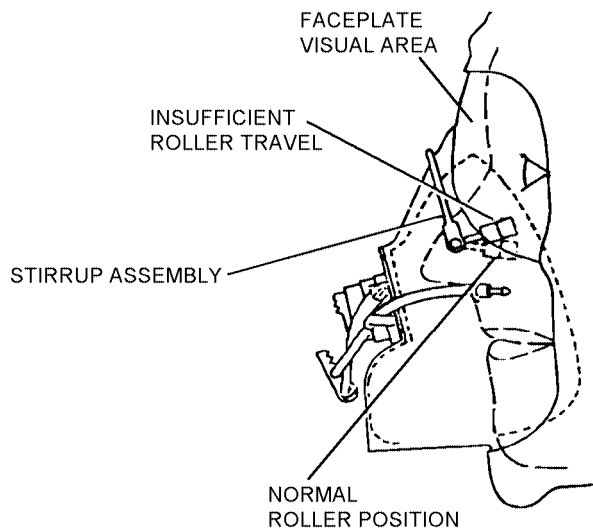


Step 6 - Para 4-92

4p92s6

7. If leakage of air through nose is evident, determine which of the following adjustments should be made and perform corrective action (figure 4-42).

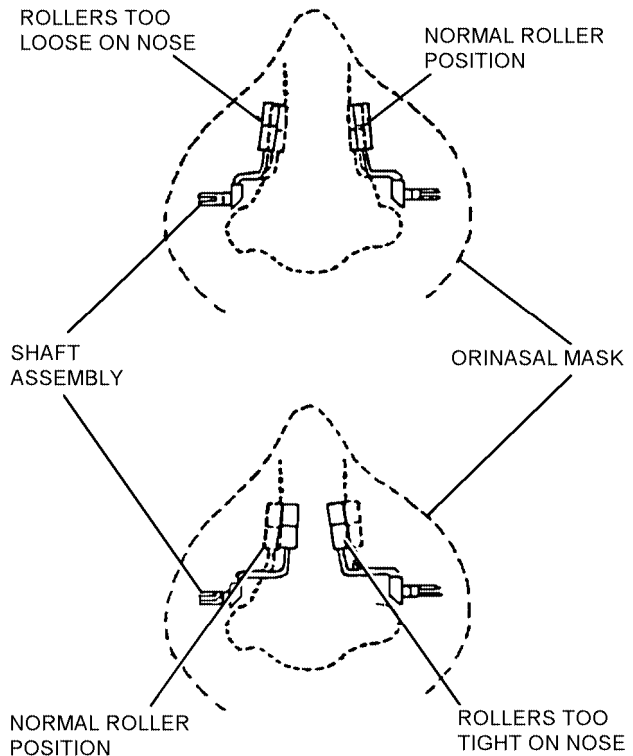
a. Insufficient roller travel down nose to occlude. Proceed to [step 8](#), Insufficient Roller Travel.



Step 7a - Para 4-92

4p92s7a

b. Improper roller width, rollers pass in front of bridge of nose but are too tight or too loose for proper occlusion. Proceed to [step 9](#), Improper Roller Width.



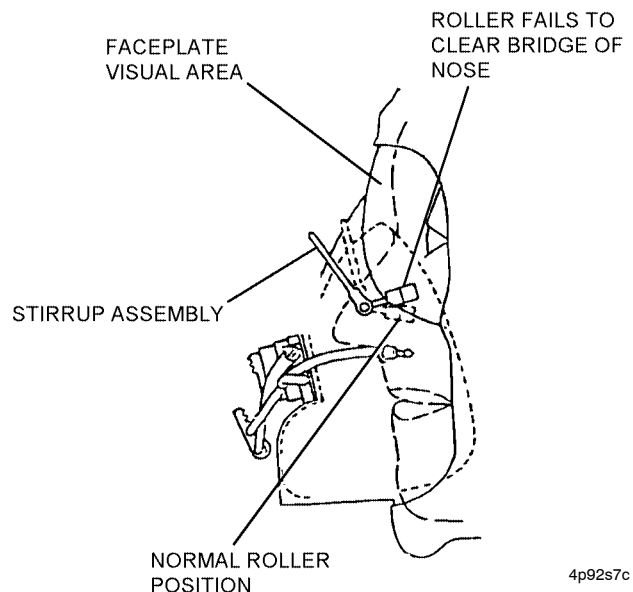
Step 7b - Para 4-92

4p92s7b

c. Improper roller arm length; rollers fail to clear bridge of nose, or are too far back on nose to properly occlude. Proceed to [step 10](#), Improper Roller Arm Length.

NOTE

If excessive spline adjustments are made, discomfort to wearer may result due to pressure exerted on nose by occluder in its resting position.



Step 7c - Para 4-92

4p92s7c

8. Insufficient Roller Travel: If roller travel is at fault, more travel is necessary to achieve proper occluding position; a slight spline adjustment away from the orinasal mask nose bridge is necessary. Adjust and repeat [step 6](#). If after several spline adjustments more pressure on the nose is necessary and/or wearer experiences discomfort due to pressure exerted by the rollers in their resting position, select a nose occluder kit of same arm size, larger offset. Repeat [steps 2 through 6](#). Once subject becomes satisfied with performance and comfort of nose occluder, proceed with [paragraph 4-94](#).

9. Improper Roller Width: If distance between the rollers is at fault and rollers are too loose on nose (in the occluding position), select a kit of same arm size, with a larger offset. If partial occlusion was achieved but rollers are too tight on the nose, select a kit of same arm size with a smaller offset. Repeat [steps 2 through 6](#). Once subject becomes satisfied with performance and comfort of nose occluder, proceed with [paragraph 4-94](#).

10. Improper Roller Arm Length: If the rollers seat too far back on nose, or are blocked by bridge of nose upon occlusion, select a kit of smaller arm size, same offset. Repeat [steps 2 through 6](#). Once subject becomes satisfied with performance and comfort of nose occluder, proceed with [paragraph 4-94](#).

4-93. FINAL FITTING AND ADJUSTMENT.

4-94. Donning for Fitting. Donning of respirator assembly shall be supervised by a qualified Aircrew Survival Equipmentman (PR), and shall proceed as follows:

NOTE

The appropriate respirator variant must integrate with the CMU-29(V)1/P or (V)2/P vest configured as detailed in NAVAIR 13-1-6.7-4 manual prior to donning the system for final fitting. Modification of aircrewmember's helmet to accept CBR adapter straps must also be done as part of the fitting procedures. Procedures for modifying the helmet with the applicable helmet attachment kit are detailed in NAVAIR 13-1-6.7-3.

1. Have subject don appropriate CMU-29(V)1/P or (V)2/P Vest.

2. Subject shall don skull cap, head band, etc., if so desired. These items are recommended to improve comfort and to keep perspiration out of the eyes.

3. Turn pusher fan ON. Selector knob on H-manifold shall be in the open position (horizontal).



Be careful not to rip neck seal when donning mask.

4. Holding skull cap in place, instruct subject to place hands inside neck seal with palms together and pull open. Slide down over head. Adjust mask for orinasal mask comfort and good visibility.

5. Assist the wearer in seating mask neck seal, ensuring neck seal is not rolled up and lies flat. Ensure hood outlet valve is open.

6. Turn pusher fan OFF.

7. Subject shall don an applicable aircrew helmet and secure and tighten chin strap.

8. Plug-in intercommunication unit and turn ON. (See [figure 4-17](#) for ground communication connection.)

9. Turn pusher fan ON.

10. Subject shall connect toggle harness assembly to helmet as shown in [figure 4-43](#).

NOTE

The toggle harness cables shall lie over hooks on faceplate front, with the V-bow in the up position.

11. Flip the V-bow down into flight position, and adjust toggle harness assembly ([figure 4-43](#)).

NOTE

Adjustment of toggle harness assembly is made by rotating adjustable swivel link.

12. With the filtered air supply flowing, clamp hood ventilation hose by application of slight finger and thumb pressure. Request wearer to hold breath, and test the adequacy of orinasal mask-to-face sealing. If air is felt leaking out from edge of orinasal mask, further adjustment of the toggle harness assembly should be made and orinasal mask-to-face seal retested. If leakage is still evident on retest, replace with a smaller or larger size orinasal mask.

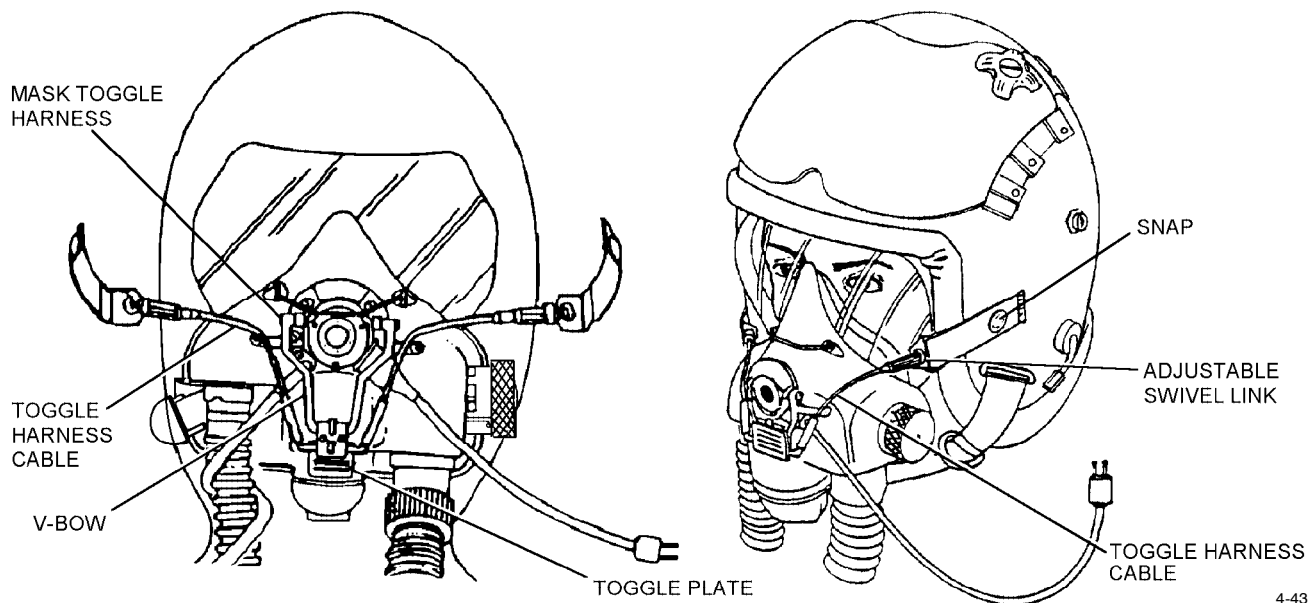


Figure 4-43. Toggle Harness Connection.

4-43

4-95. Final Fitting of Nose Occluder. Instruct subject to raise stirrup and attempt to valsalva. In some cases there will be a tendency for the faceplate to lift slightly as the user attempts to pass the rollers over the bridge of the nose. This may be accompanied by the failure of the rollers to pass over the bridge, and thus interfering with their effective downward travel; both conditions can prevent proper occlusion. However, these effects usually may be overcome by instructing the subject to hold and force the faceplate down with the thumb and three fingers, while using the index finger to raise the stirrup assembly. If unsuccessful, refer to [paragraph 4-92, step 6](#).

4-96. WEARER FAMILIARIZATION PROCEDURES.

4-97. Hood Outlet Valve Familiarization.

WARNING

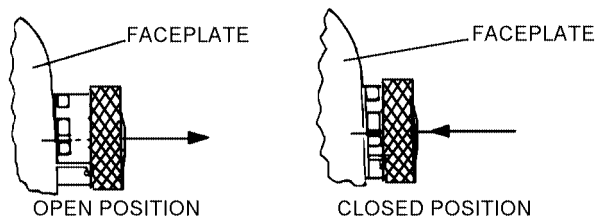
If the pusher fan fails to operate in a contaminated environment or if the aircrewmember is immersed in water, close the valve.

NOTE

The valve shall be in its open position for normal flight operation.

1. Request user to operate hood outlet valve from the open to closed position and back to the open position by pulling and rotating the hood outlet valve lever as illustrated.

2. Repeat the cycle from OPEN to CLOSED and return to OPEN until the aircrewmember is satisfied with operation of the valve.



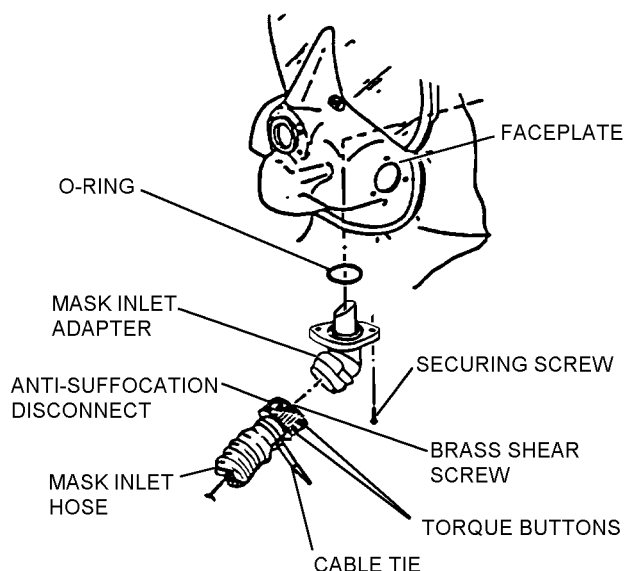
Step 2 - Para 4-97

4p97s2

4-98. Anti-Suffocation Disconnect Familiarization.

1. Remove and retain brass shear screw.

2. Request the aircrewmember to uncouple (clockwise rotation) and then pull anti-suffocation disconnect from the mask inlet adapter.



4p98s1

Steps 1 and 2 - Para 4-98

NOTE

The cycle of disconnecting and reconnecting the anti-suffocation disconnect is to be repeated until the aircrewmember is satisfied as to the orientation and operation of the anti-suffocation disconnect facility.

3. At the final reconnection of the anti-suffocation disconnect, ensure that the mask inlet hose is not twisted.

WARNING

Ensure shear screw is installed.

4. Fit shear screw (brass) to lock the connector.

5. Apply a slight twisting motion to the connector to assure the shear screw engages the edges of the locking slot machined in the mask inlet adapter.

6. Examine the mask inlet adapter, particularly for damage and security of attachment.

4-99. DOFFING AFTER FITTING. After fitting, have subject remove respirator assembly as follows:

1. Disconnect toggle harness assembly from helmet snaps.

2. Unplug intercom.

3. Assist the wearer to doff his protective helmet.

4. Assist the wearer to doff mask, being careful not to disturb or dislodge the (as-yet unlocked) nose occluder components.

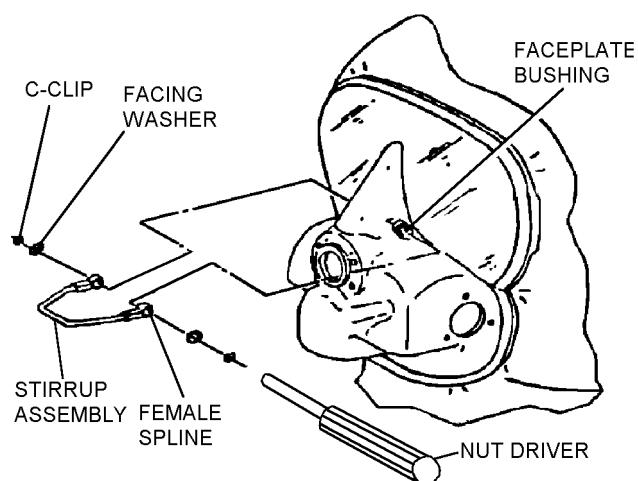
5. Switch the pusher fan OFF.

6. Remove CMU-29(V)1/P or (V)2/P vest.

4-100. LOCKING STIRRUP ASSEMBLY. Lock stirrup assembly in position by applying the appropriate washers and C-clips to the external end of each shaft assembly. For ease of C-clip installation proceed as follows:

1. Ensure stirrup assembly is in the down position. If right handed, use left hand inside of mask to support shaft assembly during C-clip installation; vice versa if left handed.

2. Ensure the shaft assembly is completely seated through stirrup end. Place washer on shaft end and ensure C-clip groove is visible with washer in place.



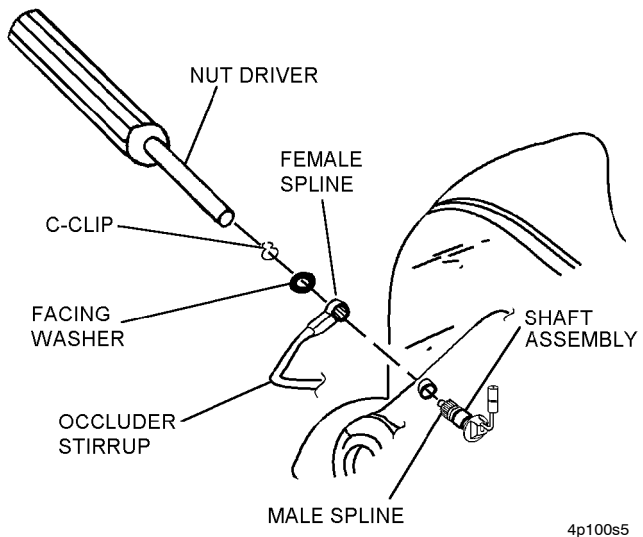
4p100s2

Step 2 - Para 4-100

3. Apply Krytox to the end of a 1/8-inch nut driver. Krytox will serve as lubrication during installation and will hold C-clip in place on the nut driver.

4. Place C-clip on end of nut driver and adjust C-clip to be perfectly centered over the nut driver opening.

5. Line up 1/8-inch nut driver directly over center of shaft end and press C-clip into groove. Verify that C-clip is properly seated.



Step 5 - Para 4-100

6. Repeat steps 1 thru 5 for opposite side.
7. After fitting is complete, clean mask assembly.

NOTE

Rubber products have a natural memory and may develop permanent wrinkles or folds over a period of time when stored wrinkled or folded.

8. Following cleaning, carefully place mask in its transit case with as few folds and wrinkles as possible. Secure with retaining straps as illustrated on the transit case lid.

4-101. TRANSIT AND READY FOR USE STORAGE. To prepare the mask for transit or ready-for-use storage (figure 4-62), proceed as follows:

1. Fit velveteen cover, ensuring correct position on the faceplate.
2. Ensure nose occluder is in its downmost position (when fitted).
3. Place mask face-up in transit case, ensuring toggle harness and microphone cord are lying away from optical areas.
4. Carefully fold hood in and around faceplate, ensuring all hoses and drink tube lie flat and are free from kinks.
5. Secure mask in transit case with retaining straps as illustrated inside case lid.
6. Store communications unit in appropriate compartment.

7. (LOX and OBOGS) - Store seat kit hose and regulator in long pocket at spine of case.
8. Place pusher fan at bottom of transit case.
9. Place canister and 90° rubber molding subassembly (if applicable) between delivery hoses below mask and above H-manifold.
10. Stow CMU-29(V)1/P or CMU-29(V)2/P vest with survival vest.

4-102. HOSE ADAPTATIONS. Instructions for adapting existing hose assemblies to work with the A/P22P-14(V)2 and (V)3 Respirator Assemblies are contained in the following paragraphs. To modify an existing hose assembly, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Tape, Ethylene Propylene	Scotch, 3M, 130C
As Required	Tape, PVC	Scotch, 3M, Super 88

1. AV-8B Aircraft, SKU-6/A seat survival kit oxygen/communications hose assembly. Upper and lower P/N REDAR A11206-2 and REDAR A11226-1 taping procedure.
 - a. Trim silicone rubber wire keepers from existing hose assembly (figure 4-44) and discard.
 - b. Starting with seat kit to aircraft console hose (P/N REDAR A11228-1) assembly, start taping from flare nut end with Scotch 3M 130C Ethylene Propylene tape. Stretch tape to 3/4 of its original width and wrap tape to form a smooth void-free lay-up. When wrapping tape, ensure tape overlaps itself by at least 1/2 the tape width.
 - c. Work the tape up the hose to the console disconnect. End taping by wrapping up to console connector and back down over the applied tape 1-1/2 inches (figure 4-45 and 4-46).
 - d. Ensure all silicone rubber and cloth sections of the hose are completely covered.
 - e. Repeat above taping procedure with Super 88 Polyvinyl Chloride (PVC) plastic tape. Starting at console connector, apply while stretching tape to 5/8 of its original width and wrap tape to form a smooth void-free layup. When wrapping the tape, ensure the tape overlaps itself by at least 1/2 the tape width (figure 4-47). Work down the length of the hose from the console connector and back up the length of the hose to form a second layer of PVC tape. Ensure all silicone rubber surfaces of the hose are completely covered.

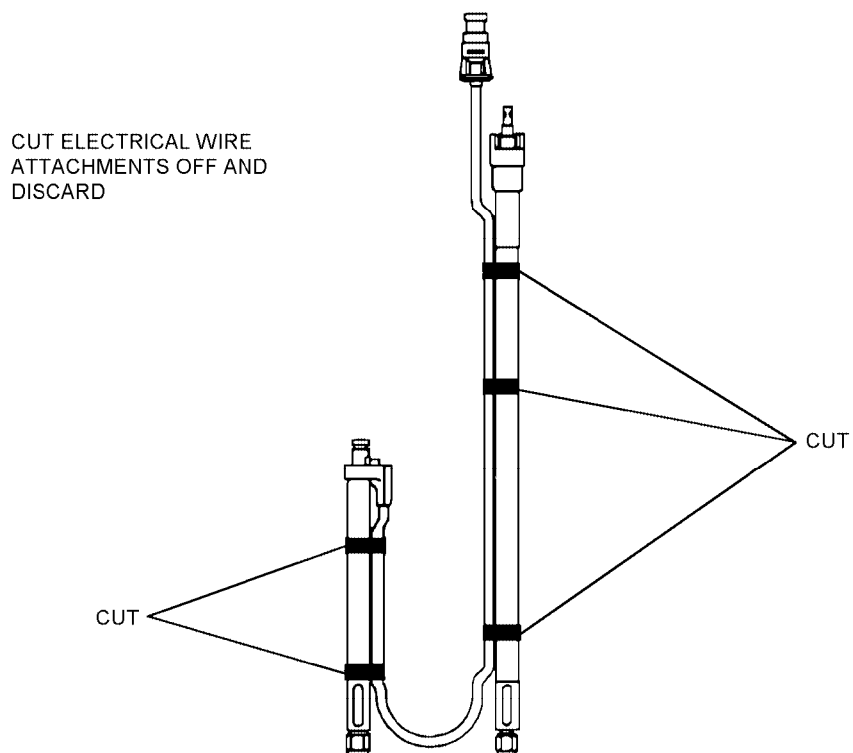


Figure 4-44. Trim Wire Keepers

4-44

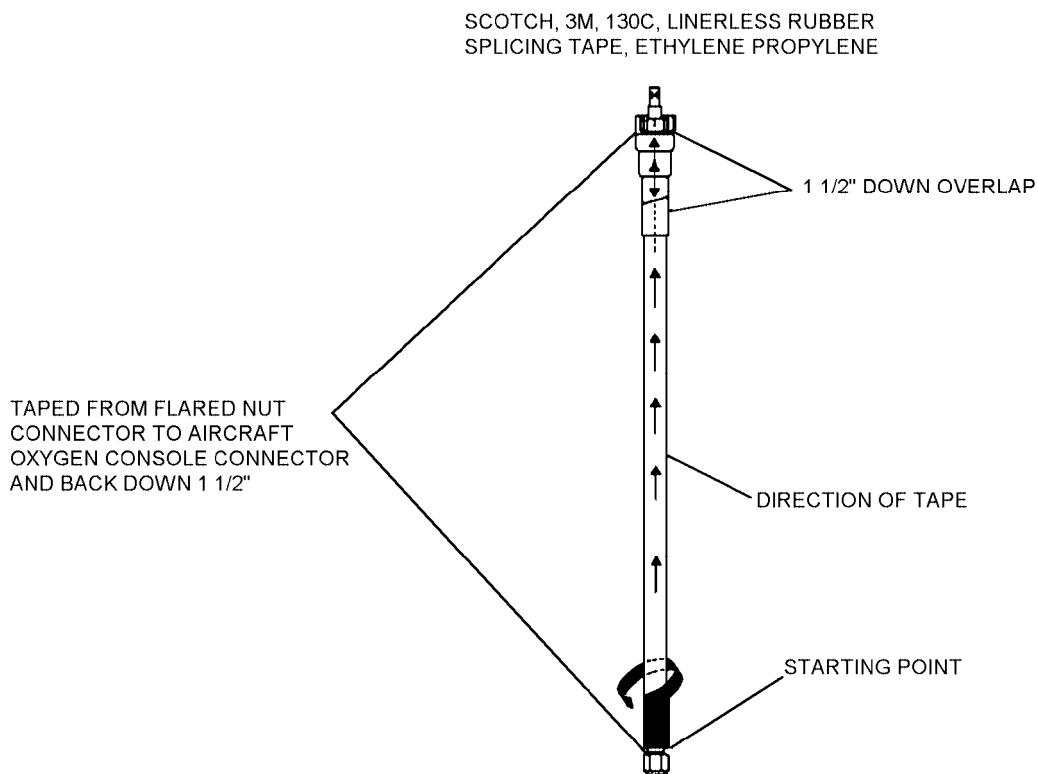


Figure 4-45. Seat Kit to Aircraft Console Hose Assembly Taping

4-45

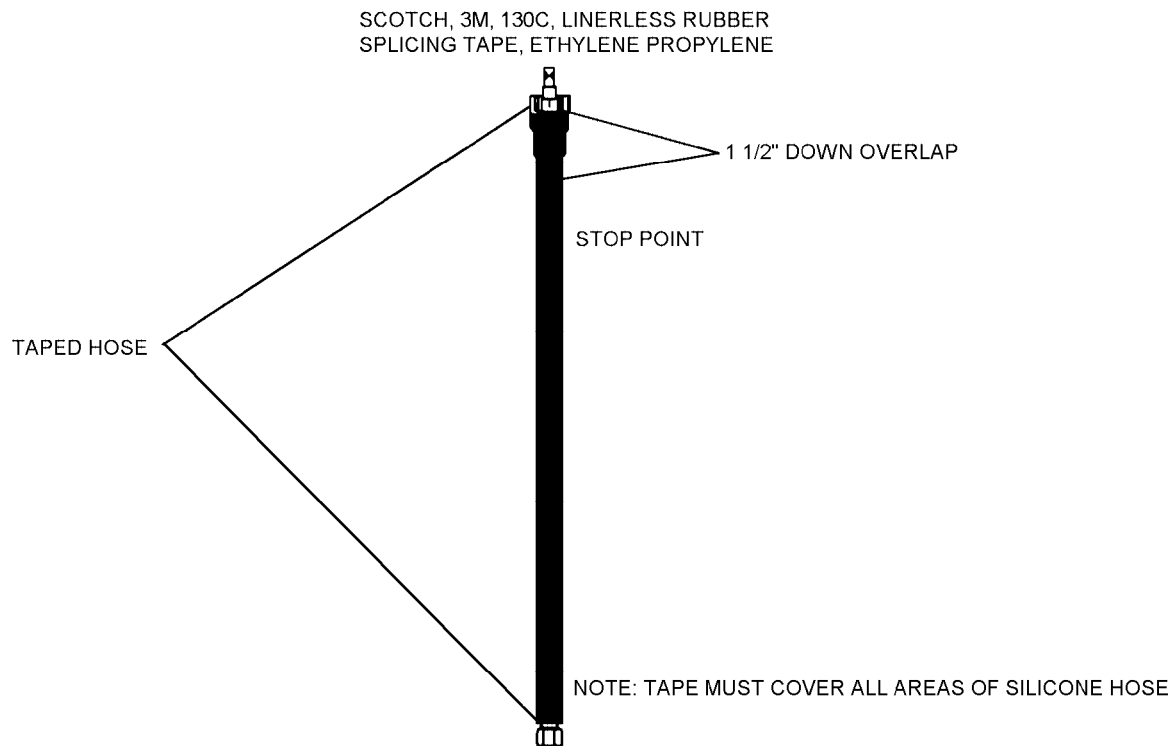


Figure 4-46. Seat Kit to Aircraft Console Hose Assembly Taping

4-46

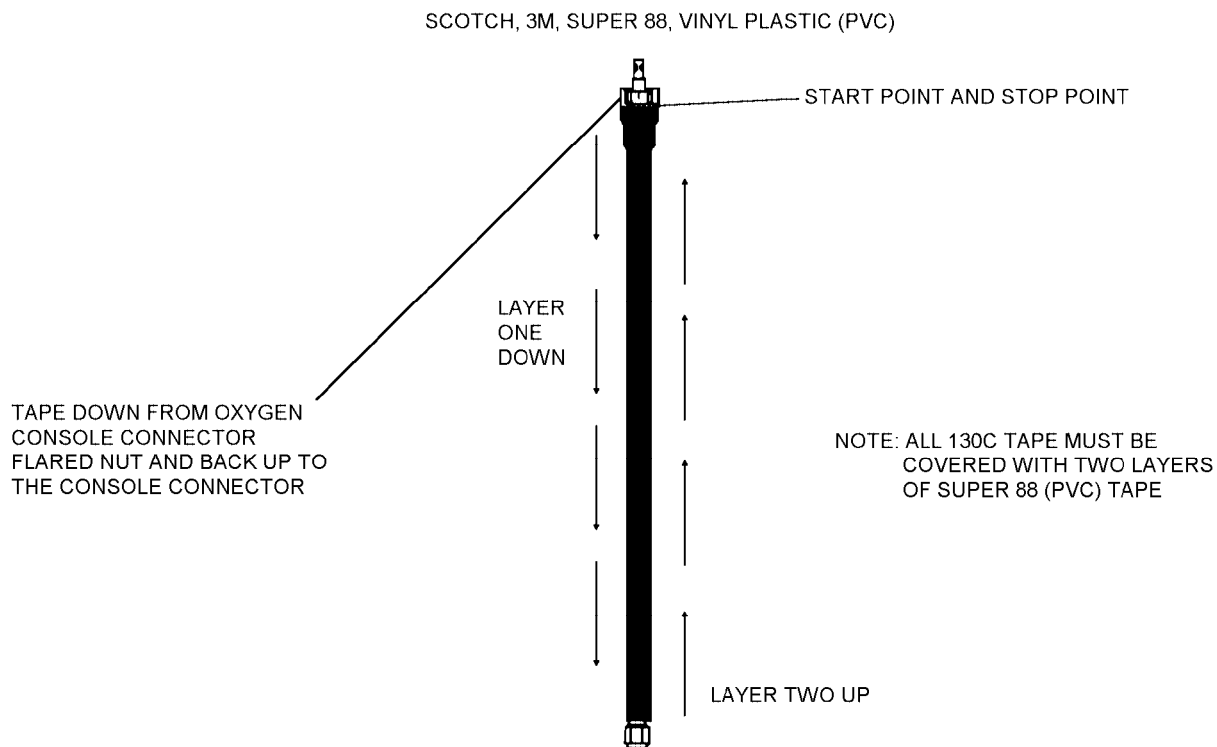


Figure 4-47. Seat Kit to Aircraft Console Hose Assembly Taping

4-47

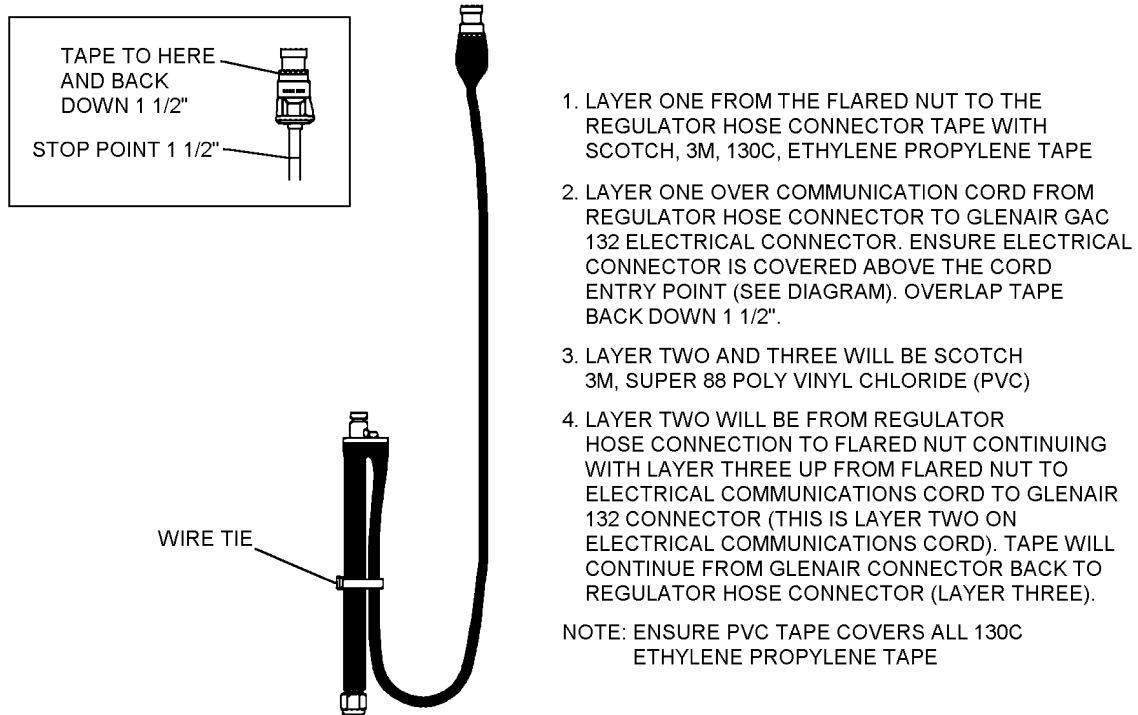


Figure 4-48. Survival Kit to Regulator Hose Assembly Taping

4-48

f. Repeat [steps b-e](#) with the survival kit to regulator hose assembly (P/N REDAR A11227-1) ([figure 4-48](#)). Start taping at the flared nut end of the hose assembly connector. Ensure connector is wrapped completely, continue taping up the communication cord up to the Glenair GAC132 electrical connector.

g. Repeat [steps b-e](#) for the regulator to survival kit hose assembly (P/N REDAR A11206-2) ([figures 4-49](#) to [4-53](#)).

h. After taping is completed, communication cord can be attached to the regulator hose assembly with a cable tie approximately 2 inches from the flared nut. Cut excess wire tie end ([figure 4-48](#)).

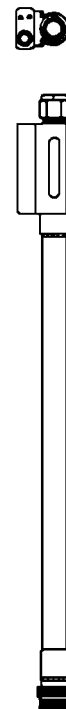
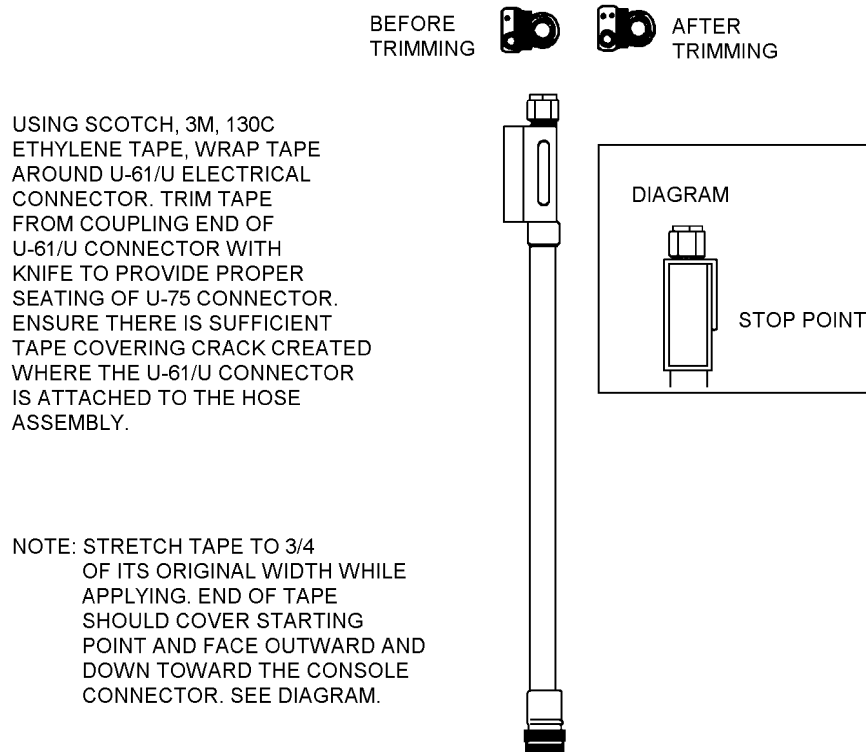


Figure 4-49. Regulator to Survival Kit Hose Assembly Taping

4-49



4-50

Figure 4-50. Regulator to Survival Kit Hose Assembly Taping

NOTE

It is most important that all areas of the silicone hose assemblies are covered by a layer of Scotch, 3M, 130C Ethylene Propylene tape and two (2) layers of Scotch, 3M, Super 88 Polyvinyl chloride tape. At the present time these are the only authorized tapes to use.

2. F/A-18 Oxygen/Communications hose assembly P/N253D900-1 taping procedure.

a. Trim silicone rubber wire keepers or cable tie (if ACB 622 is installed) from existing hose assembly (figure 4-44) and discard.

b. Starting with seat kit to aircraft console hose (P/N253D900-7) assembly, start taping from flare nut end with Scotch, 3M, 130C Ethylene Propylene tape. Stretch tape to 3/4 of its original width and wrap tape to form a smooth void-free layup. When wrapping

tape, ensure tape overlaps itself by at least 1/2 the tape width.

c. Work tape up hose to console disconnect. End taping by wrapping up to console connector and back down over the applied tape 1-1/2 inches (figures 4-45 and 4-46).

d. Ensure all silicone rubber, heat shrink insulation sleeving (if ACB 622 is installed), and cloth sections of hose are completely covered.

e. Repeat above taping procedure with Super 88 Polyvinyl Chloride (PVC) plastic tape. Starting at the console connector, apply while stretching tape to 5/8 of its original width and wrap tape to form a smooth void-free layup. When wrapping the tape, ensure the tape overlaps itself by at least 1/2 the tape width (figure 4-47). Work down the length of hose from console connector and back up the length of the hose to form a second layer of PVC tape. Ensure all silicone rubber surfaces of the hose are completely covered.

1. USING SCOTCH, 3M, 130C ETHYLENE TAPE, WRAP HOSE FROM THE SEAT HOSE OXYGEN CONNECTOR TO THE FLARED NUT U-61/U CONNECTOR END.
2. FINISH WITH 1 1/2 INCHES OF TAPE GOING BACK DOWN OVER ITSELF.

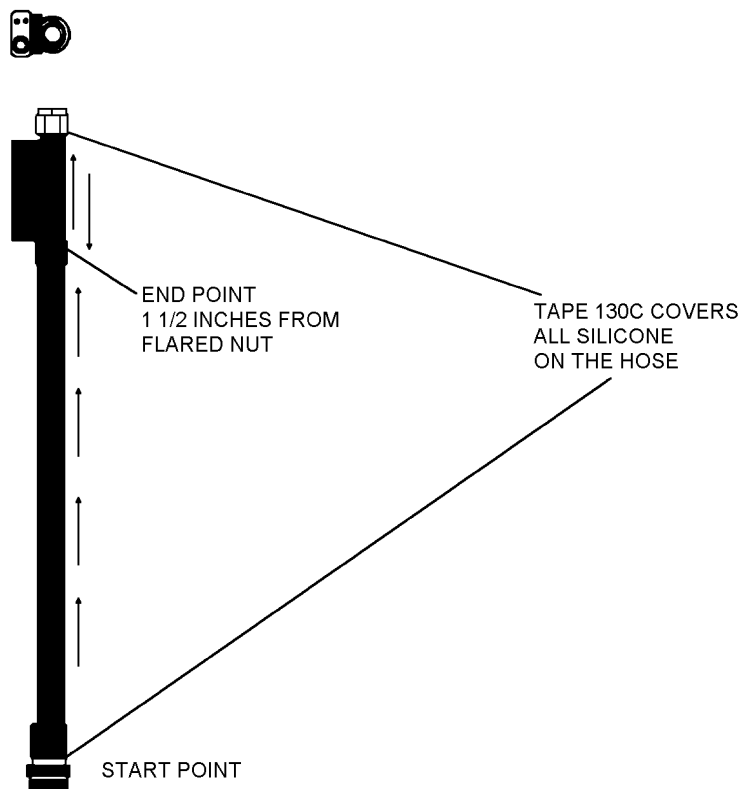


Figure 4-51. Regulator to Survival Kit Hose Assembly Taping

4-51

USING SCOTCH, 3M, SUPER 88 TAPE, WRAP HOSE FROM FLARED NUT U-61/U CONNECTOR TO SEAT HOSE OXYGEN CONNECTOR BACK UP THE HOSE TO THE FLARED NUT U-61/U.

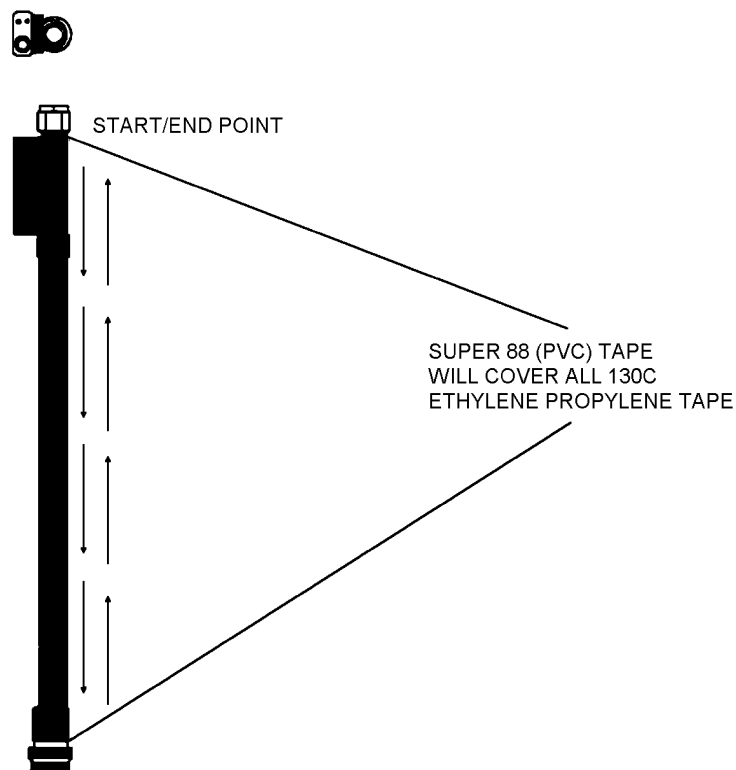


Figure 4-52. Regulator to Survival Kit Hose Assembly Taping

4-52

USING SCOTCH, 3M, SUPER 88 POLYVINYL CHLORIDE (PVC) TAPE, WRAP U-61/U ELECTRICAL CONNECTOR. TRIM EXCESS OVER U-61/U CONNECTOR AS IN FIGURE A7

WHITE AREA OF U-61/U SHOWN WILL BE THE TAPED AREA

NOTE: APPLY WHILE STRETCHING TAPE TO 5/8 OF ITS ORIGINAL WIDTH. END OF TAPE SHOULD COVER STARTING POINT AND FACE OUTWARD AND DOWN TOWARD CONSOLE CONNECTOR. SEE DIAGRAM

IF TAPE IS APPLIED PROPERLY TRIMMING MAY NOT BE REQUIRED. CHECK FIT BY INSERTING A U-78 CONNECTOR INTO THE U-61/U CONNECTOR.

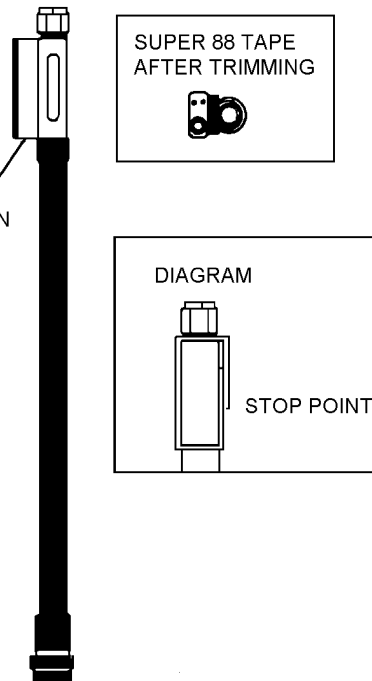


Figure 4-53. Regulator to Survival Kit Hose Assembly Taping

4-53

f. Repeat [steps b-e](#) with survival kit to regulator hose assembly (P/N253D900-3). Start taping at flared nut end of hose assembly connector. Ensure connector is wrapped completely and continue taping up communication cord to Glenair GAC132 electrical connector.

g. After taping is completed, communication cord can be attached to the regulator hose assembly with a wire tie approximately 2 inches from the flared nut. Cut excess wire tie end ([figure 4-48](#)).

NOTE

It is most important that all areas of the silicone hose assemblies are covered by a layer of Scotch, 3M, 130C Ethylene Propylene tape and two (2) layers of Scotch, 3M, Super 88 Polyvinyl chloride tape. At the present time these are the only authorized tapes to use.

3. Modified regulator to seat kit hose P/N33C1178-1 taping procedure.

NOTE

For this application P/N 33C1178-1 has been modified to fit AV-8B aircraft oxygen/communication seat kit hose assembly P/N 33C1178-1.

a. [Figures 4-54 to 4-57](#) provide instructions (that shall be followed) for (CBR hardening) taping of modified regulator to seat kit hoses (P/N 33C1189-1).

4. Unmodified regulator to seat kit hose P/N 33C1178-1 taping procedure.

a. [Figures 4-58 to 4-61](#) provide instructions (that shall be followed) for (CBR hardening) taping of unmodified regulator to seat kit hoses (P/N 33C1189-1).

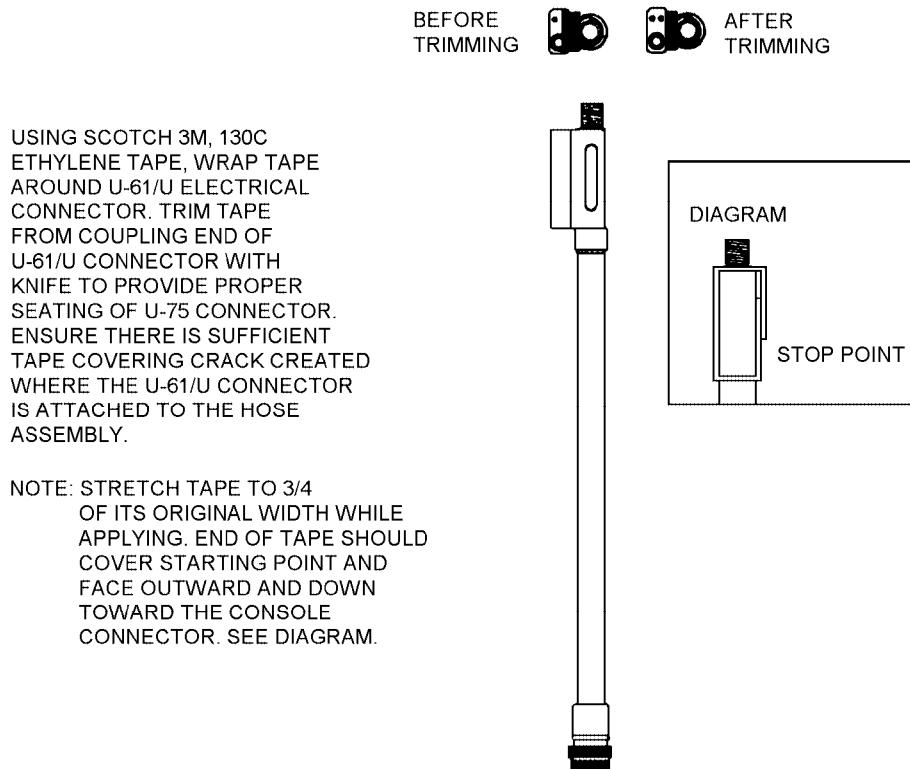


Figure 4-54. Modified Regulator to Seat Kit Hose Assembly Taping

4-54

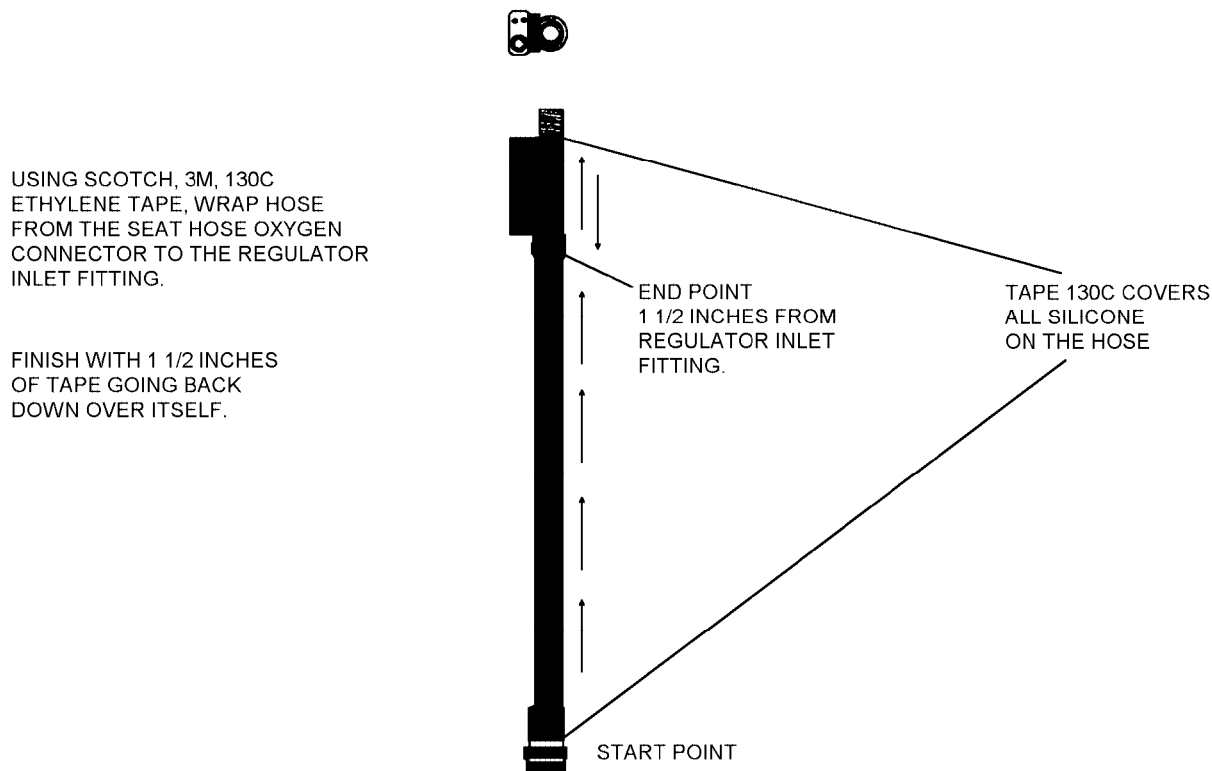


Figure 4-55. Modified Regulator to Seat Kit Hose Assembly Taping

4-55

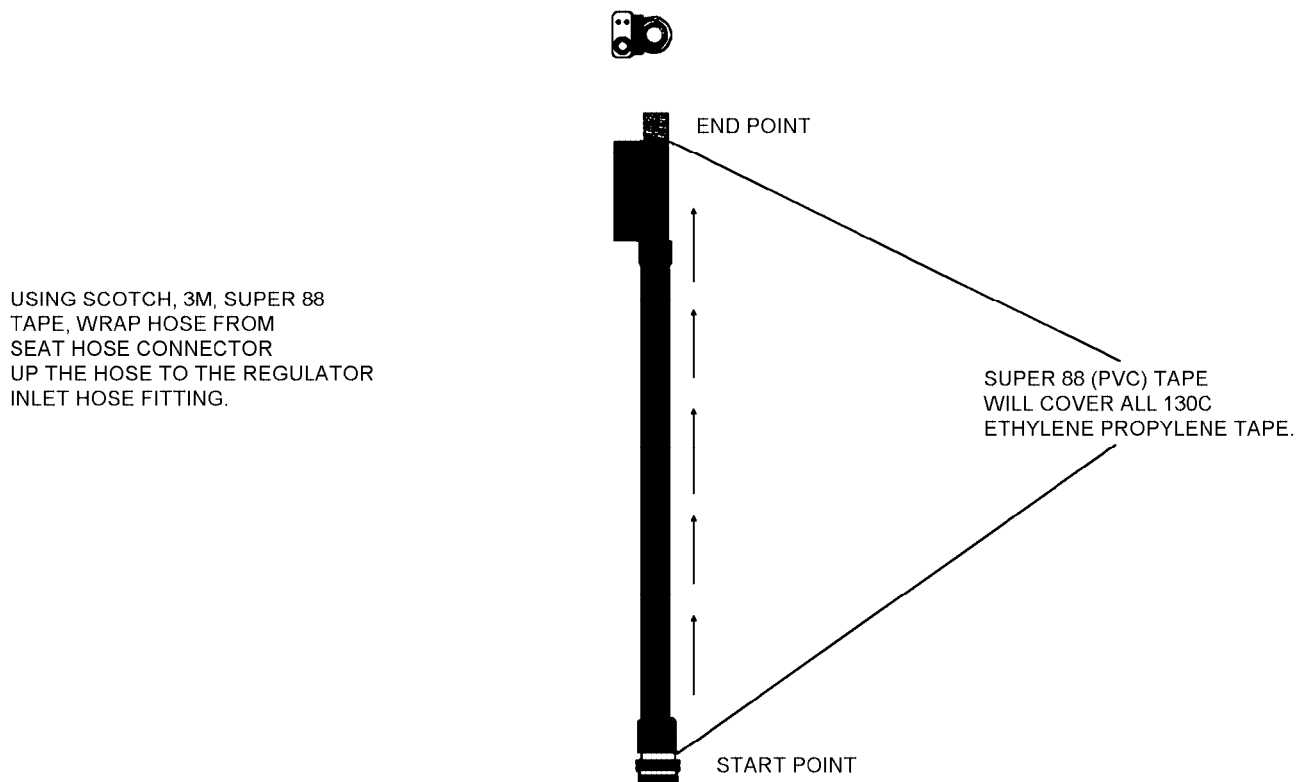


Figure 4-56. Modified Regulator to Seat Kit Hose Assembly Taping

4-56

USING SCOTCH, 3M, SUPER 88 POLYVINYL CHLORIDE (PVC) TAPE, WRAP U-61/U ELECTRICAL CONNECTOR. TRIM EXCESS OVER U-61/U CONNECTOR AS IN FIGURE A7.

WHITE AREA OF U-61/U SHOWN WILL BE TAPED AREA.

NOTE: APPLY WHILE STRETCHING TAPE TO 5/8 OF ITS ORIGINAL WIDTH. END OF TAPE SHOULD COVER STARTING POINT AND FACE OUTWARD AND DOWN TOWARD CONSOLE CONNECTOR. SEE DIAGRAM.

IF TAPE IS APPLIED PROPERLY, TRIMMING MAY NOT BE REQUIRED. CHECK FIT BY INSERTING U-78 CONNECTOR INTO U-61/U CONNECTOR.

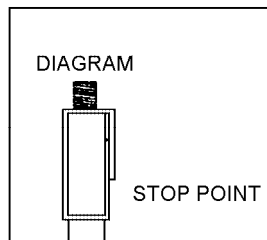


Figure 4-57. Modified Regulator to Seat Kit Hose Assembly Taping

4-57

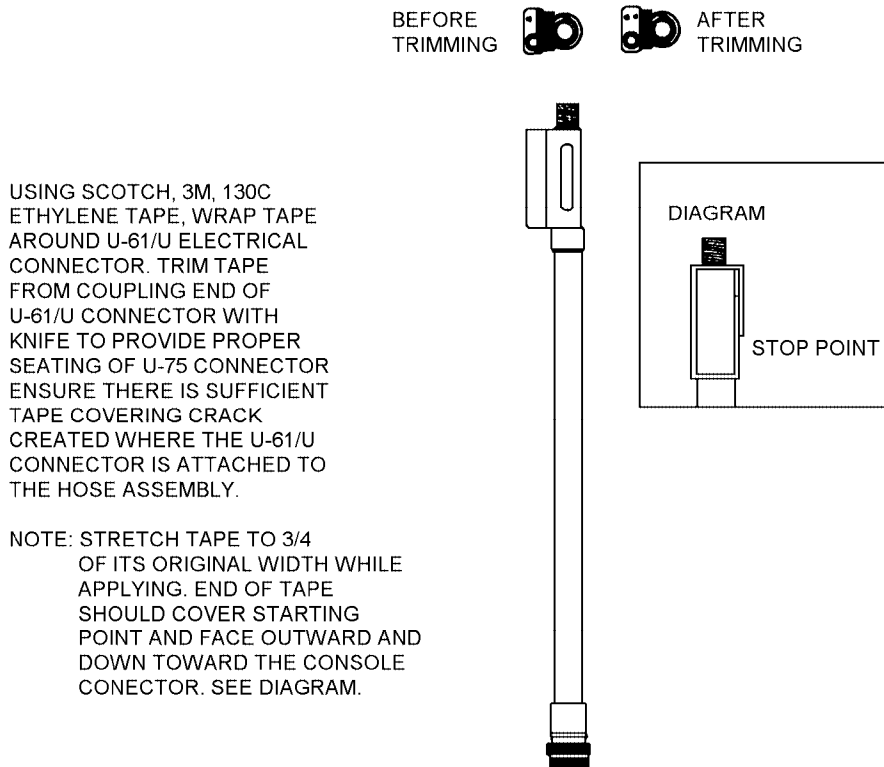


Figure 4-58. Unmodified Regulator to Seat Kit Hose Assembly Taping

4-58

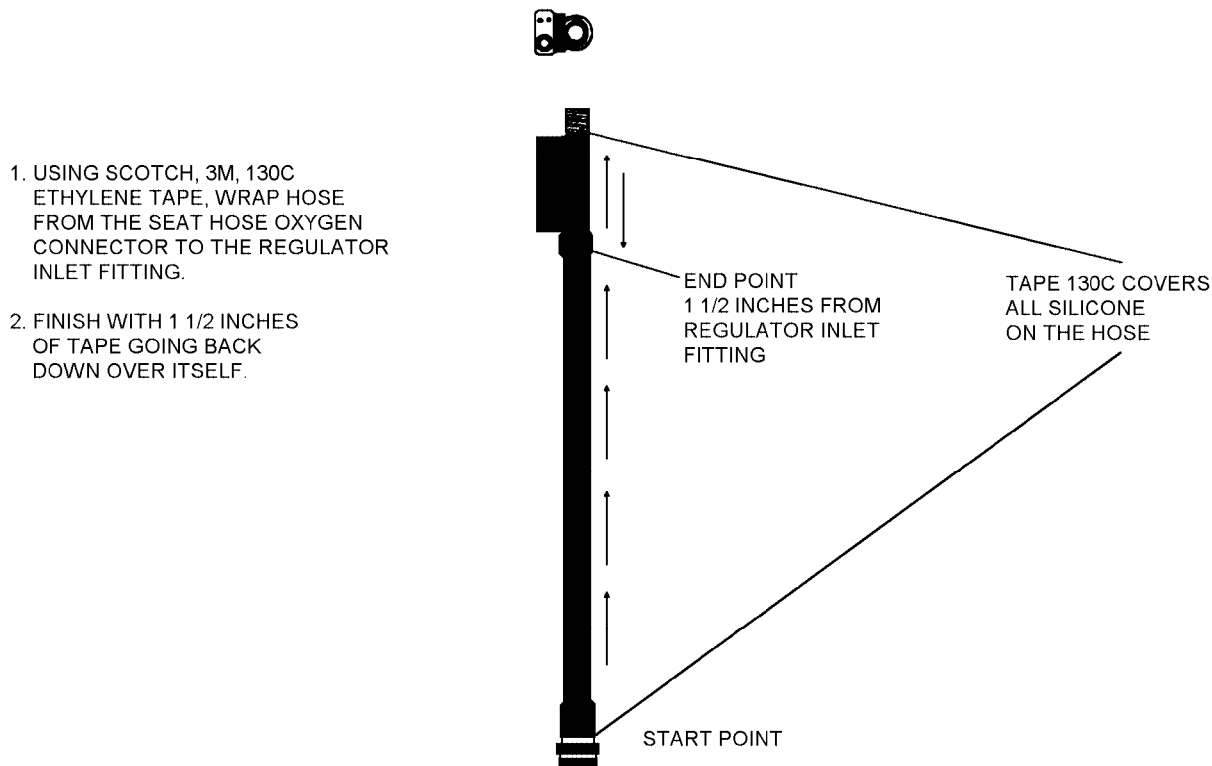


Figure 4-59. Unmodified Regulator to Seat Kit Hose Assembly Taping

4-59

USING SCOTCH, 3M, SUPER 88 TAPE, WRAP HOSE FROM FLARED NUT U-61/U CONNECTOR TO SEAT HOSE OXYGEN CONECTOR BACK UP THE HOSE TO THE FLARED NUT U-61/U.

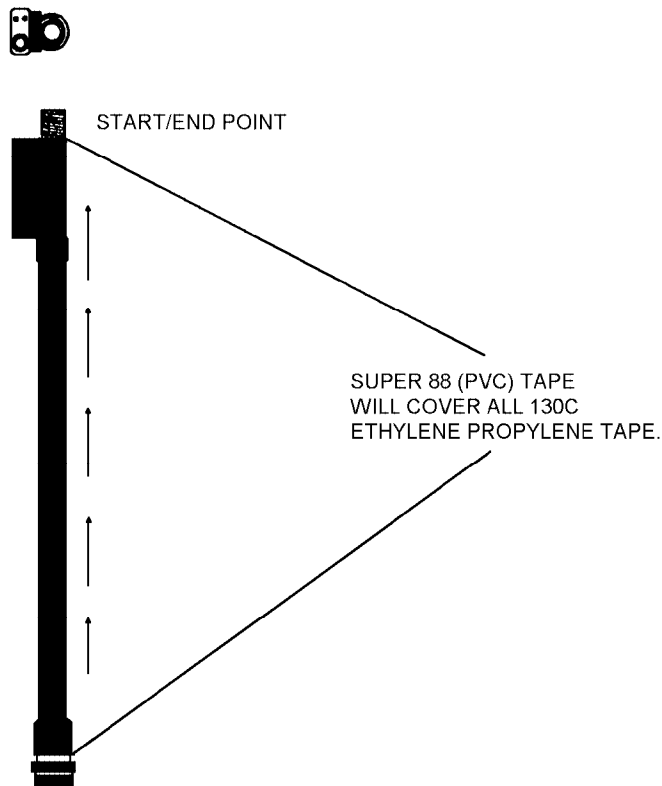


Figure 4-60. Unmodified Regulator to Seat Kit Hose Assembly Taping

4-60

USING SCOTCH, 3M, SUPER 88 POLYVINYL CHLORIDE (PVC) TAPE, WRAP U-61/U ELECTRICAL CONNECTOR. TRIM EXCESS OVER U-61/U CONNECTOR AS IN FIGURE A7.

WHITE AREA OF U-61/U SHOWN WILL BE TAPED AREA.

NOTE: APPLY WHILE STRETCHING TAPE TO 5/8 OF ITS ORIGINAL WIDTH. END OF TAPE SHOULD COVER OUTWARD AND DOWN TOWARD CONSOLE CONNECTOR. SEE DIAGRAM.

IF TAPE IS APPLIED PROPERLY, TRIMMING MAY NOT BE REQUIRED. CHECK FIT BY INSERTING A U-78 CONNECTOR INTO THE U-61/U CONNECTOR.

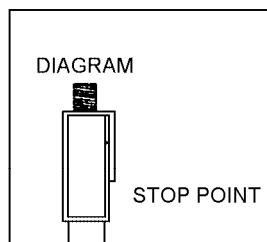


Figure 4-61. Unmodified Regulator to Seat Kit Hose Assembly Taping

4-61

Section 4-4. Maintenance

4-103. GENERAL.

4-104. This section contains the procedural steps for unpacking and inspecting, testing, troubleshooting, disassembling, cleaning, repairing and assembling the A/P22P-14(V)1 thru (V)4 Respirator Assemblies.

4-105. INSPECTIONS.

NOTE

Only a small quantity of respirator assemblies shall be opened or removed for in-flight proficiency training and for fitting aircrew. Training masks may be rotated among aircrewmembers when properly cleaned in accordance with this manual to maintain proper hygiene. The remaining quantities will be permanently stored in their transit cases inside the sealed foil bag. If the foil bags can no longer be partially vacuum packed and heat sealed in their original condition, refer to Storage in [Chapter 2](#). Inspections do not need to be performed unless the masks are removed from storage and placed in service for contingency in-flight or training missions. Respirators that have been removed from their sealed foil bag and are in the Calendar Inspection cycle may be vacuum packed and resealed in a foil bag and removed from all inspection cycles during long term storage.

4-106. PLACE-IN-SERVICE INSPECTION. The Place-In-Service Inspection shall be performed by a qualified Aircrew Survival Equipmentman (PR). The inspection shall include unpacking, Visual Inspection, fitting, cleaning of the internal surfaces, functional checks and bench testing of all assemblies and their component parts where specified. Unpacking, Visual Inspection, battery charging and cleaning of the internal surfaces shall be performed at Organizational Maintenance Level (O-Level). Bench testing shall be performed at the Intermediate Maintenance Level (I-Level).

Materials Required

Quantity	Description	Reference Number
As Required	Pad, Gauze	—
As Required	Water	—
As Required	Cloth, Cotton	—
As Required	Cloth, Abrasive	—

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Cleaning Compound Type I	MIL-C-43616
As Required	Towelettes, SANI-COM	No. 3205 (CAGE 18195)
1	Brush, Sable	—
1	Brush, Acid	NIIN 00-514-2417
As Required	Swab, Cotton	—
As Required	Alcohol, Isopropyl Rubbing	TT-I-735 NIIN 00-655-8366
As Required	Cloth, Chamois	—
As Required	Cleaner, Tobacco Pipe	NIIN 00-292-9946
1	Cable Tie, 3.6 mm	CL 6226

Support Equipment Required

Quantity	Description	Reference Number
1	Cable Tie Tool	NIIN 00-937-5438
1	Pincer Tool, Low Profile	Oetiker 14100055
	or	
1	Pliers, Hose Clamp	NIIN 01-073-4187

CAUTION

When performing inspections on respirator assemblies, avoid pulling on ripaway toggle assembly.

4-107. Unpacking Transit Case.

WARNING

When first opening foil storage bag, make certain to cut only at the heat sealed end. Carefully cut as close to the heat seal line as possible. This will allow the bag to be partially vacuum packed and re-sealed in the future.

1. Cut open foil storage bag.
2. Remove and retain silica gel desiccant.

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3. Remove transit case from silver foil storage bag. Retain bag for future use.

4. Remove the mask from the transit case ([figure 4-62](#)).

5. Check the transit case packing list to confirm all items are included.

6. Document in accordance with OPNAVINST 4790.2 Series.

NOTE

If any variant is received fully assembled, i.e. the Pusher Fan and Oxygen Delivery Subassemblies are assembled, then skip the following initial assembly procedures and proceed to Visual Inspection.

4-108. Initial Assembly.

4-109. A/P22P-14(V)1

1. Ensure (V)1 variant is configured and J-manifold is oriented as shown in [figure 4-1](#).

2. Ensure J-manifold gasket is installed in J-manifold. If not, install so that gasket seats flush.

3. Acquire a new C2A1 filter canister from its container and screw (clockwise) into J-manifold until securely tight. Do not overtighten.

4. Remove pusher fan from transit case and install over filter canister and align as shown in [figure 4-63](#) with the air inlet in-line with H-manifold and mask inlet hose.

5. Remove the 18 inch cable tie, from the transit case, and position around the pusher fan as shown in [figure 4-67](#). Secure cable tie with a cable tie tool set to the HVY (No. 8) setting.

6. Perform Visual Inspection on mask.

4-110. A/P22P-14(V)2.

1. Ensure (V)2 variant is configured and J-manifolds are oriented as shown in [figure 4-2](#).

2. Ensure J-manifold gaskets are installed in both J-manifolds. If not, install so that each gasket seats flush.

3. Acquire a new C2A1 filter canister from its container and screw (clockwise) into the right-side J-manifold until securely tight. Do not overtighten.

4. Remove pusher fan from transit case and install over filter canister and align as shown in [figure 4-64](#).

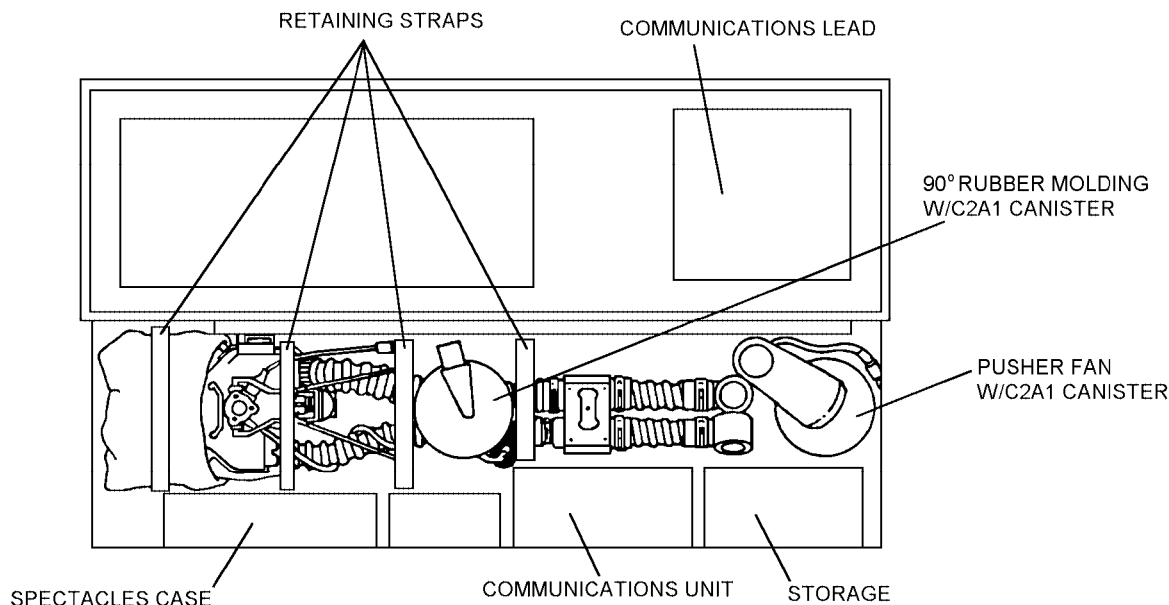
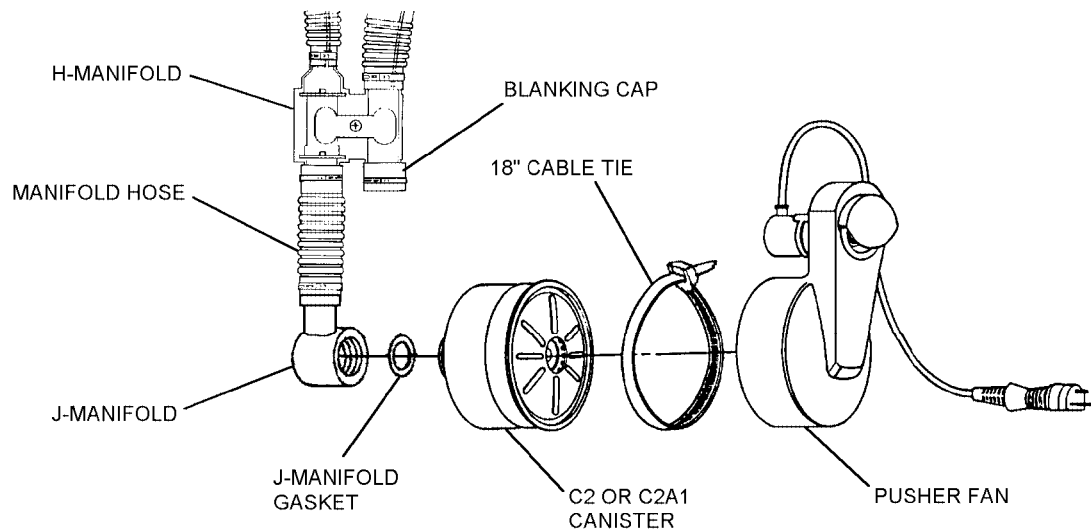


Figure 4-62. Stowage Position of Respirator Assembly in Transit Case

4-62



4-63

Figure 4-63. Assembling Pusher Fan Subassembly to J-Manifold - (V1) Only

5. Remove 18 inch cable tie, from the transit case, and position around the pusher fan as shown in [figure 4-67](#). Secure cable tie with a cable tie tool set to the HVY (No. 8) setting.

6. Acquire another C2A1 filter canister from its container and screw (clockwise) into the left-side J-manifold until securely tight. Do not overtighten.

7. Install 90° rubber molding over the C2A1 filter canister and align as shown in [figure 4-64](#).

8. Install the other 18 inch cable tie and position around 90° rubber molding as shown in [figure 4-67](#). Secure cable tie with a cable tie tool set to the HVY (No. 8) setting.

9. Install 3/4 inch to 3/4 inch connector to 90° rubber molding and secure with a 24.5 mm stepless low profile clamp.

10. Install regulator hose to the 3/4 inch to 3/4 inch connector. Secure with a 24.5 mm stepless low profile clamp.

NOTE

The free end of the hose is connected directly to the LOX regulator and secured

with a 24.5 mm clamp. This procedure will be performed during the Pre-flight inspection.

11. Perform Visual Inspection on mask.

4-111. A/P22P-14(V)3.

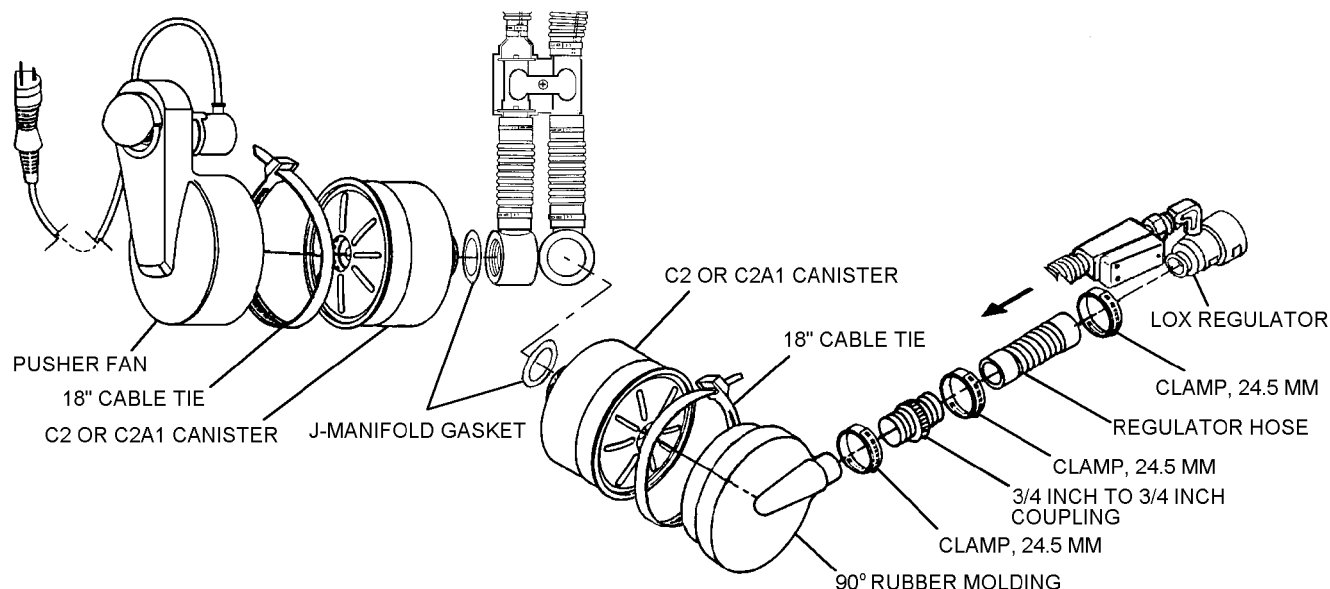
1. Ensure (V)3 variant is configured and J-manifolds are oriented as shown in [figure 4-3](#).

2. Ensure J-manifold gaskets are installed in both J-manifolds. If not, install so that each gasket seats flush.

3. Acquire a new C2A1 filter canister from its container and screw (clockwise) into right-side J-manifold until securely tight. Do not overtighten.

4. Remove pusher fan from transit case and install over filter canister and align as shown in [figure 4-65](#).

5. Remove the 18 inch cable tie, from transit case, and position around pusher fan as shown in [figure 4-67](#). Secure cable tie with a cable tie tool set to the HVY (No. 8) setting.



004064

Figure 4-64. Assembling Pusher Fan and Oxygen Delivery Subassemblies to J-Manifolds - (V)2 Only

6. Acquire another C2A1 filter canister from its container and screw (clockwise) into left-side J-manifold until securely tight. Do not overtighten.

7. Install 90° rubber molding over C2A1 filter canister and align as shown in figure 4-65.

8. Install the other 18 inch cable tie and position around 90° rubber molding as shown in figure 4-67. Secure cable tie with a cable tie tool set to the HVY (No. 8) setting.

9. Install bayonet connector to 90° rubber molding and secure with a 24.5 mm stepless low profile clamp.

NOTE

For C-20/C-40 Cockpit Aircrew application, the CRU-103 must be placed in service in accordance with the 13-1-6.4 Series Manual.

The OBOGS regulator is connected directly to the bayonet connector. This procedure will be performed during Pre-flight inspection.

10. Perform Visual Inspection on mask.

4-112. A/P22P-14(V)4.

1. Ensure (V)4 variant is configured and J-manifolds are oriented as shown in figure 4-4.

2. Ensure J-manifold gaskets are installed in both J-manifolds. If not, install so that each gasket seats flush.

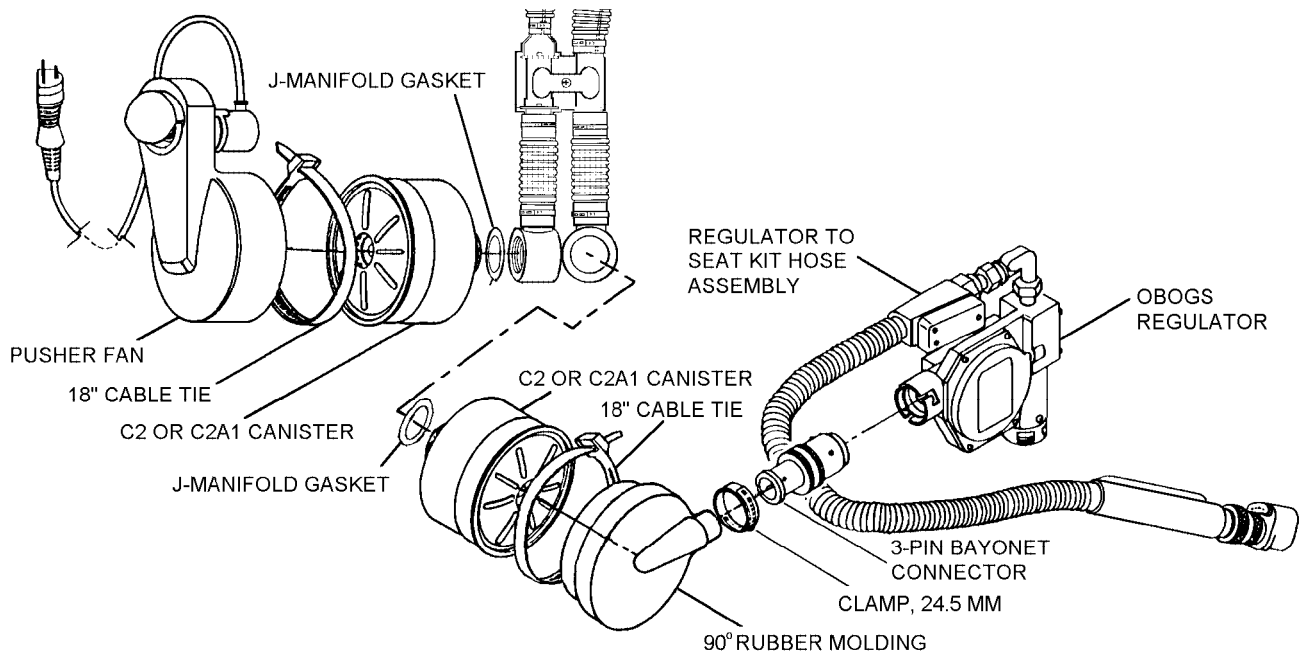
3. Acquire a new C2A1 filter canister from its container and screw (clockwise) into the right-side J-manifold until securely tight. Do not overtighten.

4. Remove pusher fan from transit case and install over filter canister and align as shown in figure 4-66.

5. Remove 18 inch cable tie, from transit case, and position around the pusher fan as shown in figure 4-67. Secure cable tie with a cable tie tool set to the HVY (No. 8) setting.

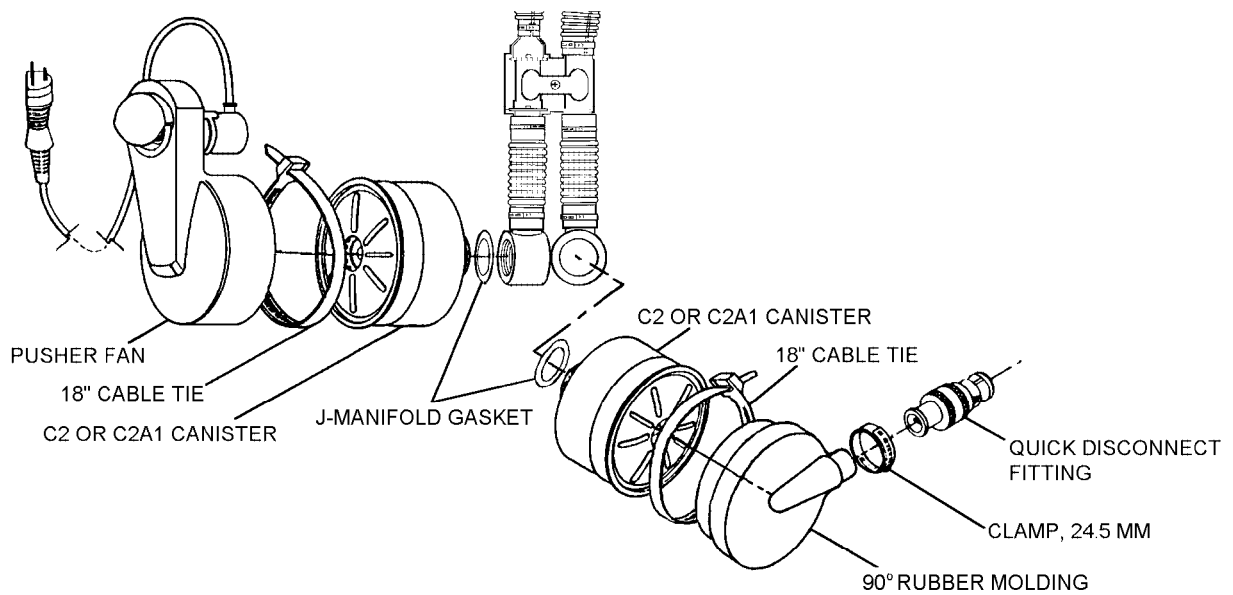
6. Acquire another C2A1 filter canister from its container and screw (clockwise) into left-side J-manifold until securely tight. Do not overtighten.

7. Install 90° rubber molding over the C2A1 filter canister and align as shown in figure 4-66.



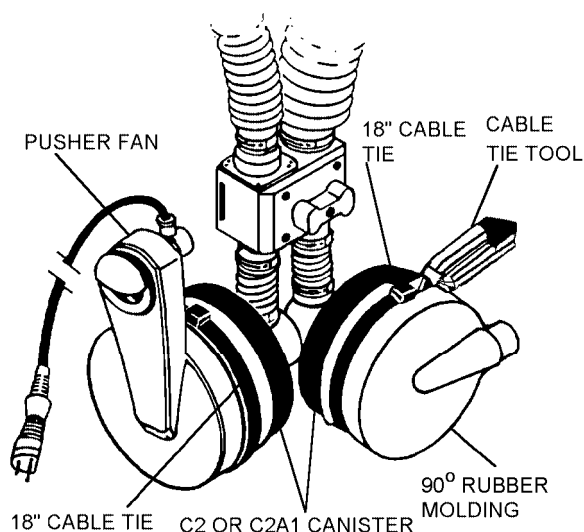
4-65

Figure 4-65. Assembling Pusher Fan and Oxygen Delivery Subassemblies to J-Manifolds - (V)3 Only



4-66

Figure 4-66. Assembling Pusher Fan and Oxygen Delivery Subassemblies to J-Manifolds - (V)4 Only



4-67

Figure 4-67. Applying Cable Ties to Pusher Fan and 90° Rubber Molding

8. Install the other 18 inch cable tie and position around 90° rubber molding as shown in [figure 4-67](#). Secure cable tie with a cable tie tool set to the HVY (No. 8) setting.

9. Install quick disconnect to 90° rubber molding and secure with a 24.5 mm stepless low profile clamp.

NOTE

The panel mount regulator hose is connected directly to the bayonet connector. This procedure will be performed in the cockpit during aircraft pre-flight.

10. Perform Visual Inspection on mask.

4-113. Visual Inspection.

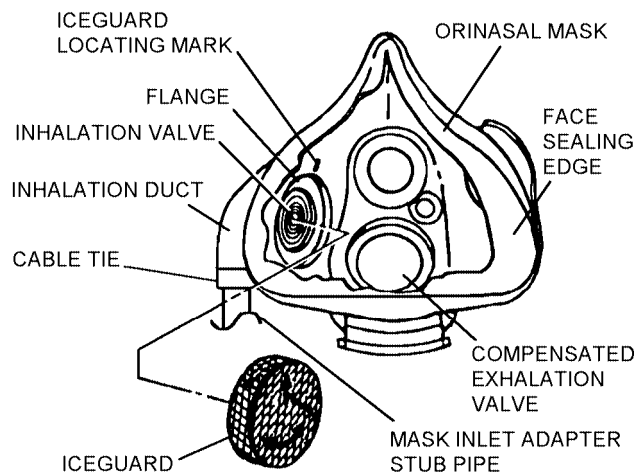
4-114. Respirator Assembly. Referring to [figure 4-69](#) and other figures as indicated, inspect the respirator assembly as follows:

1. Hood, apron and neck seal for damage, deterioration and security of bonded joints. Invert the hood to inspect internal seams.

2. Iceguard for damage and blockage. Refit. Ensure it is in locked position. (Arrow engraved on the iceguard body should point toward the compensated exhalation valve.) ([Figure 4-68](#).)

3. Inhalation valve for freedom from obstruction. Remove iceguard and inspect stepped rubber

valve for dirt or signs of obstruction. Ensure correct positioning. (Lug slots should be at right angles to mark in orinasal mask.) ([Figure 4-68](#).)



4-68

Figure 4-68. Orinasal Mask, Iceguard, Inhalation Duct and Compensated Exhalation Valve

4. If nose occluder is installed, check shaft assemblies on nose occluder for damage and security of attachment. If nose occluder is not installed, check that rubber blanking plugs in faceplate nose occluder bushings are fully seated.

5. Orinasal mask for damage and deterioration of face sealing edge, and the area contacted by shaft assemblies of nose occluder.

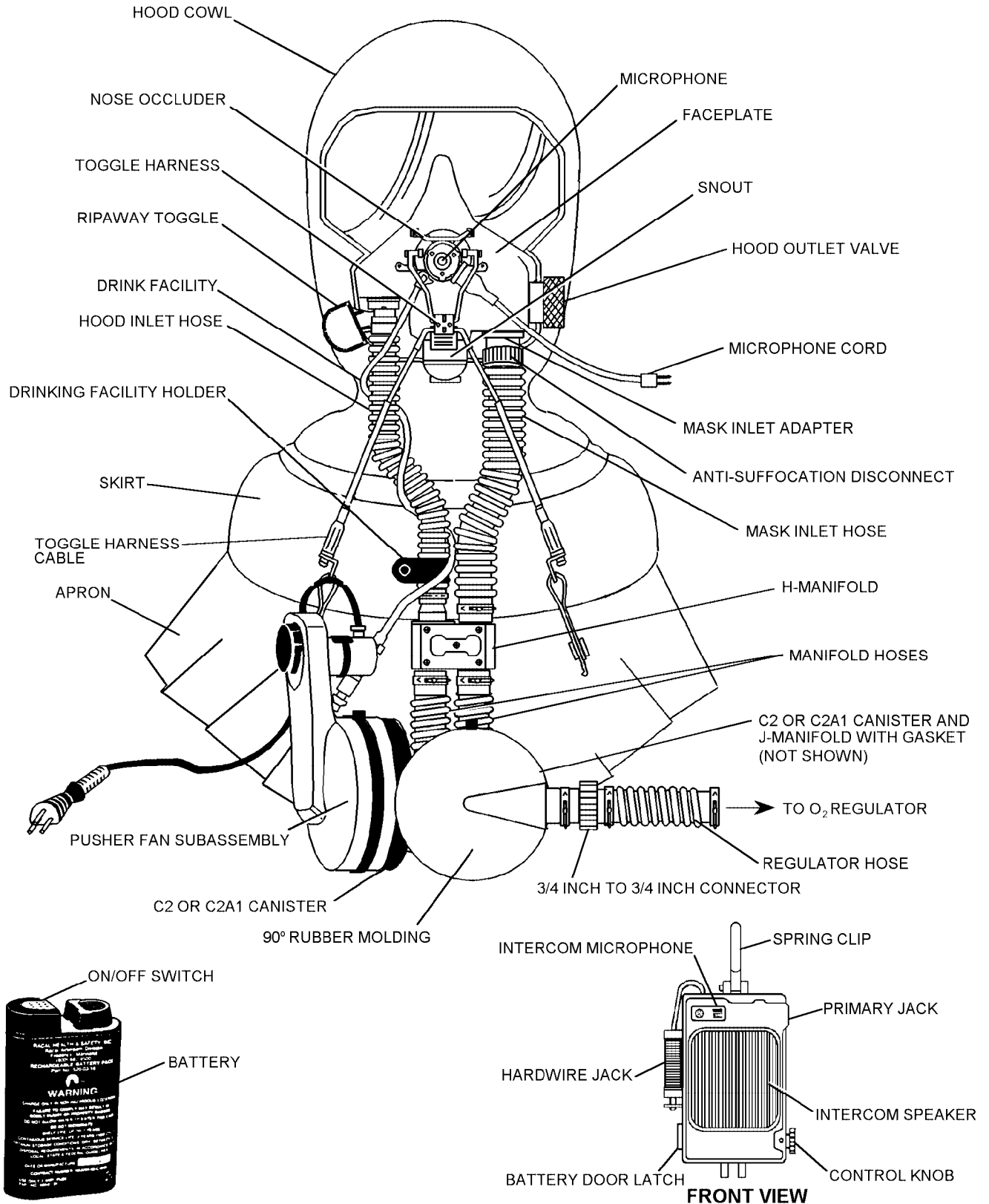
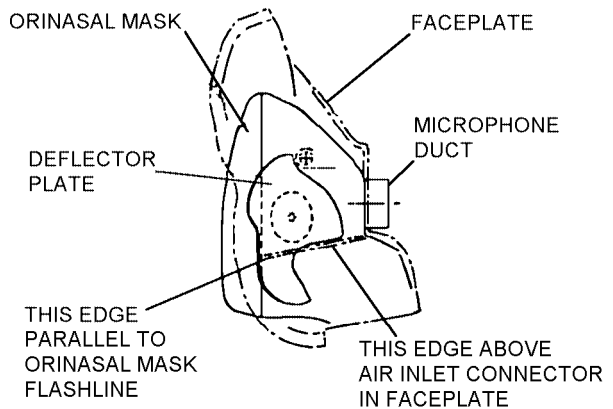


Figure 4-69. A/P22P-14(V)2 Respirator Assembly, Pusher Fan Battery and Intercommunications Unit

4-69

6. Orinasal mask inhalation duct connection to mask inlet adapter. Check cable tie for security of attachment.

7. Orinasal mask deflector plate for damage, security of attachment, and correct positioning on orinasal mask.

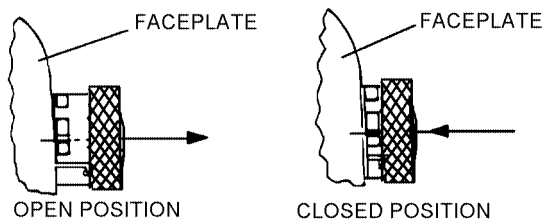


Step 7 - Para 4-114

4p114s7

8. Ensure compensated exhalation valve is free from obstruction by gently depressing metal valve plate using a non-metallic probe. Release valve plate. Inspect valve for security within orinasal mask housing.

9. Hood outlet valve for freedom from obstruction.



Step 9 - Para 4-114

4p114s9

10. Hood-to-faceplate sealing strip and padding strip for damage, deterioration and security of bonded joints.

11. Hood inlet adapter for damage, security of attachment and freedom from obstruction. Carefully restore hood to normal position.

12. Toggle harness assembly and faceplate for damage and security in vicinity of mask harness attachment screws. Check all harness assembly nuts, screws, cables, and connector links. Inspect for secu-

rity and attachment of cable assemblies, toggle plate and CBR adapter straps.

13. Microphone connecting lead for damage, deterioration, fraying and security of attachment.

14. Mask inlet adapter for damage and security of attachment.

15. Inspect anti-suffocation disconnect. Remove (brass) shear screw, disconnect and pull the mask inlet hose from mask inlet adapter and check for damage. Inspect hose for damage, deterioration and security of attachment. Examine restraint cord, particularly for damage and security of attachment. Inspect sealing O-ring within anti-suffocation disconnect for damage. Reconnect, ensuring that the lie of the mask inlet hose is satisfactory and free of kinks. Install shear screw to lock the connector.

16. Hood and mask inlet hoses for damage, deterioration and security of attachment.

17. H-manifold assembly for damage.

18. Manifold hose(s) for damage, deterioration and security of attachment.

4-115. Pusher Fan Subassembly. Inspect the pusher fan subassembly as follows:

1. Pusher fan body for signs of rips, tears, or damage.

2. Power cord for loose or corroded ends.

WARNING

Do not subject pusher fan power cord to excessive stress such as when disconnecting the battery by pulling on the cord rather than the plug. Failure to firmly grasp the plug itself when disconnecting the battery may compromise the integrity of the power cord and/or the electrical connection and result in an in-flight failure.

3. Obtain a RFI (Ready-for-Issue) battery (refer to Chapter 6).

a. If a new battery is required, conduct the Place-in-Service Inspection in accordance with Chapter 6.

b. If a RFI battery is going to be used, conduct a visual inspection and functional check.

4-116. Intercommunications Unit.

- 1. Ensure no mechanical damage, cracks or dents are found on intercom unit.
- 2. Comm cord and patch cord shall have no frayed wires, corroded pins or receptacles.
- 3. Ensure battery is not leaking fluid or any other substance.
- 4. Ensure mechanical integrity of intercom unit by checking for loose knobs, loose hardwire jack connection or a broken spring clip.



When working with oxygen, make certain that clothing, tubing fittings, and equipment are free of oil, grease, fuel, hydraulic fluid, or any combustible material. Fire or explosion can result when even slight traces of combustible material come in contact with oxygen under pressure.

4-117. Oxygen Delivery Subassembly ((V)2 through (V)4 only).

- 1. Inlet and outlet connections for security of attachment.
- 2. Regulator (if applicable), regulator hose, 90° rubber molding, clamps, connector or quick disconnect, and J-manifold for security of attachment, bends, dents, cuts, scratches, corrosion, cracks, or any other damage.
- 3. If regulator is suspect, it shall be removed and a Ready-for-Issue (RFI) regulator installed. The defective regulator shall be taken to the Aviator’s Equipment Branch for required corrective maintenance action, in accordance with NAVAIR 13-1-6.4 Series.

4-118. Battery Charging (NiCad Only). Refer to Chapter 6 for battery charging, discharging, storage and troubleshooting.

4-119. Bench Testing.

- 1. Perform bench test on the digital test set in accordance with NAVAIR 17-15HB-21.
- 2. Perform bench test on respirator assembly in accordance with paragraph 4-138.

4-120. Cleaning. The mask assembly shall be cleaned following fitting or operational use. Cleaning shall be accomplished by a qualified Aircrew Survival Equipmentman (PR) using the following procedures:

Materials Required		
Quantity	Description	Reference Number
As Required	Pad, Gauze	—
As Required	Water	—
As Required	Cloth, Cotton	—
As Required	Towelettes, SANI-COM	No. 3205 (CAGE 18195)
As Required	Bleach, Laundry	A-A-1427 NIIN 00-598-7316
1	Brush, Sable	—
As Required	Alcohol, Isopropyl Rubbing	TT-I-735 NIIN 00-655-8366
As Required	Swab, Cotton	—
As Required	Cloth, Chamois	—
1	Cable Tie, 3.6 mm	CL 6226

Support Equipment Required		
Quantity	Description	Reference Number
1	Cable Tie Tool, Standard	MS90387-1
1	Canteen	NIIN 01-118-8173
1	Canteen Cap, M-1	NIIN 00-930-2077
1	Pliers, Side Cutting, 4 inch	—

1. Clean inner hood as follows:

a. Carefully fold hood inside out to expose orinasal mask.

b. Clean internal surfaces of hood using a clean gauze pad moistened with water.

c. Wipe excess water from hood with a clean, dry cotton cloth and allow to air dry.

WARNING

Excessive dirt, sand, dried liquid nourishment, or vomit in mask assembly can degrade protection against CB agents.

d. Inspect interior of mask assembly. If excessive dirt, or foreign material is observed in mask assembly, the mask shall be disassembled and all component parts cleaned in accordance with [paragraph 4-192](#). If internal compartments of valves or hoses cannot be thoroughly cleaned, they shall be replaced.

2. Clean orinasal mask as follows:

CAUTION

Do not clean inhalation or exhalation valves with SANI-COM towelettes or laundry bleach solution.

NOTE

If SANI-COM towelettes are not available, prepare a solution of laundry bleach and clean water by mixing 1 tablespoon of liquid laundry bleach with 2 quarts of water.

a. Clean internal surfaces of orinasal mask with cleansing towelettes (Celeste SANI-COM No. 3205) being sure to wipe under the rolled-over edges of orinasal mask. If using the laundry bleach solution, moisten a gauze pad with bleach solution and squeeze

to remove excess to prevent dripping. Wipe interior of mask, exclusive of valves, being sure to wipe under the rolled-over edges of orinasal mask.

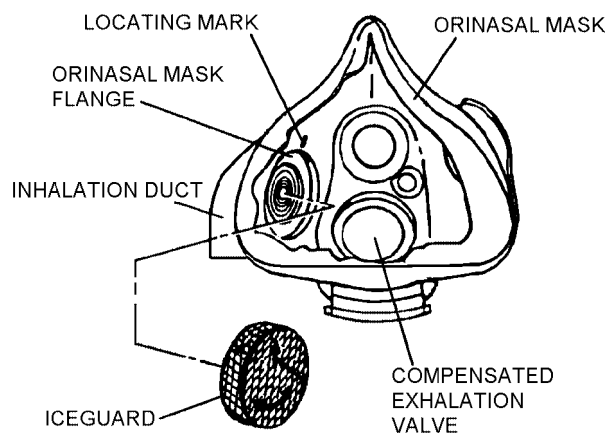
b. Wipe the microphone with a towelette.

c. Allow to air dry.

3. Clean inhalation valve as follows:

a. Turn iceguard 90° and lift it from inhalation valve assembly.

b. Gently lift valve with finger and clean underside of valve and valve seat with a sable brush moistened with water.



Step 3 - Para 4-120

4p120s3

c. Clean top of valve in the same manner.

d. Allow to air dry.

e. Clean ice guard with a sable brush and water to remove any foreign particles from mesh.

f. Allow to air dry.

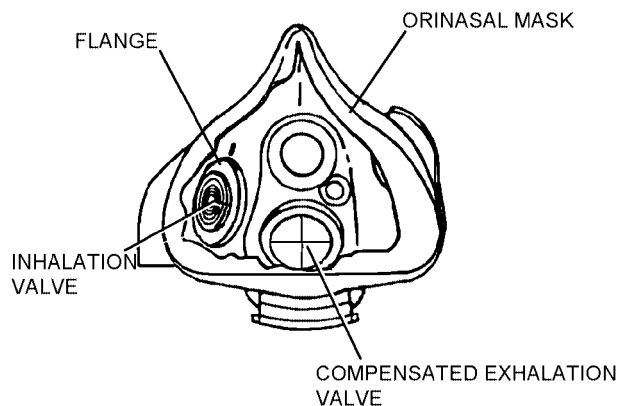
g. Reinstall iceguard by engaging the two tabs on iceguard and turning it 90° so that arrow points toward exhalation valve. Ensure the iceguard is fully seated.



Do not attempt to clean movable plate in center of the compensated exhalation valve with a cotton swab. Valve plate is delicate, and lint from cotton swab may become lodged in the valve itself.

4. Clean compensated exhalation valve as follows:

a. Clean exposed plastic area of compensated exhalation valve using a sable brush or cotton swab moistened with water. If valve is excessively dirty, isopropyl alcohol may be used. Ensure no lint or brush hairs remain in exhalation valve.



Step 4 - Para 4-120

4p120s4

b. Allow to air dry.



Damage or scratches to faceplate cannot be repaired. Use care when cleaning faceplate. Abrasive cleaners, adhesives and solvents must not be applied to visual areas of faceplate. Velveteen covers are not to be used for cleaning and polishing.

5. Clean inner surface of faceplate as follows:

a. Clean inner visual area of faceplate using water, with a soft cotton cloth or dampened chamois.

b. Wipe faceplate with clean, dry cotton cloth to remove excess water.

c. Allow to air dry.

6. Carefully restore hood to its normal position. Clean external surface of faceplate visual area in the same manner as [step 5](#) above.

7. Clean canteen and drink facility.



Do not allow laundry bleach solution to come into contact with the inside of faceplate.

a. Prepare sanitizing solution by mixing 1 tablespoon of liquid laundry bleach with 2 quarts of water. Pour half of sanitizing solution into the two quart canteen.

b. Attach canteen to drink facility quick disconnect. Invert hood and place mask over a sink.

c. Invert canteen and squeeze to force the sanitizing solution through the drink facility until the canteen is empty.

d. Disconnect canteen from drink facility quick disconnect.

e. Fill canteen half way with clean water and connect to drink facility quick disconnect. Invert canteen and squeeze to force clean water through drink facility until canteen is empty.

f. Disconnect canteen from drink facility quick disconnect.

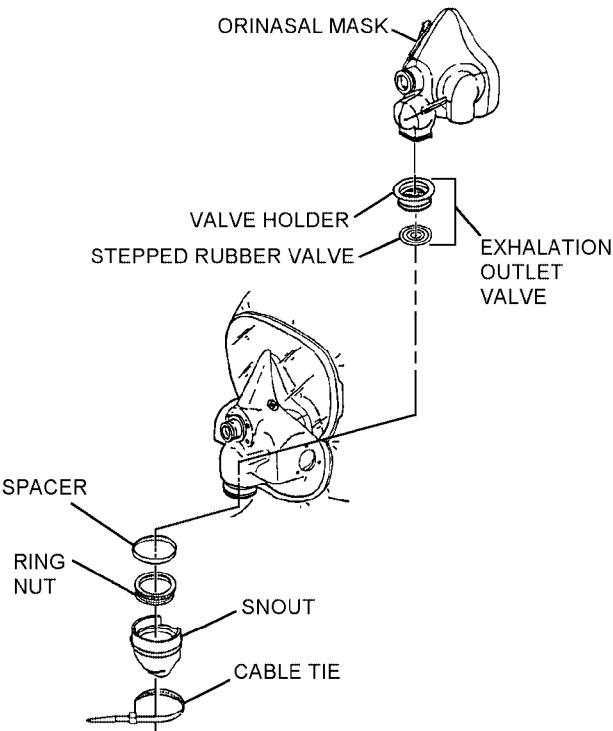
g. Connect a dry canteen to drink facility quick disconnect. Squeeze canteen to force any remaining water out of drink facility.

h. Disconnect canteen from drink facility quick disconnect.

8. Clean exhalation outlet valve as follows:

a. Remove snout to expose exhalation outlet valve. Cut cable tie and ease snout from ring nut of exhalation outlet valve holder.

b. Grasp raised rubber knob at valve center and pull valve off its seating pin.



4p120s8

**Step 8 - Para 4-120
(Disassembled View for Clarification)**

c. Clean both sides of valve and valve seat using a sable brush moistened with water.

d. Set valve aside to air dry with knob side of valve facing down on bench. Allow valve seat area to air dry.

e. Reinstall valve on seating pin, ensuring it is fully seated on pin.

f. Reinstall snout over ring nut of exhalation outlet valve holder.

(1) Position 3.6 mm black cable tie around snout with locking head to right of snout.

(2) Secure cable tie using cable tie tool set to INT (No. 4) position.

9. Clean outer hood as follows:

a. Wipe external surface of hood using a clean gauze pad moistened with water.

b. Wipe excess water from hood with a clean, dry cotton cloth and allow to air dry.

10. Reinstall velveteen cover as follows:

a. Inspect velveteen cover for dirt and abrasive particles.

b. Ensure velveteen side is folded inward and reinstall cover over visual area of faceplate.

4-121. Storage and Documentation.

NOTE

Place mask in transit case as flat as possible. Rubber products have a natural memory and may develop permanent wrinkles or folds over a period of time when stored wrinkled or folded.

1. Stow mask in accordance with paragraph 4-101.

2. Document in accordance with OPNAVINST 4790.2 Series.

4-122. PREFLIGHT INSPECTION. Preflight Inspection shall include a general spot check to ensure the A/P22P-14(V)1 thru A/P22P-14(V)4 respirator assemblies are clean and operating properly. Preflight Inspection shall be performed by a qualified Aircrew Survival Equipmentman (PR). To perform Preflight Inspection, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Pad, Gauze	—
As Required	Towelettes, SANI-COM	No. 3205 (CAGE 18195)
As Required	Water	—
As Required	Cloth, Cotton	—
As Required	Cloth, Chamois	—
As Required	Cloth, Abrasive	—
As Required	Brush, Acid	NIIN 00-514-2417
As Required	Cleaning Compound, Type I	MIL-C-43616
As Required	Anti-Fogging Kit	NIIN 00-127-7193

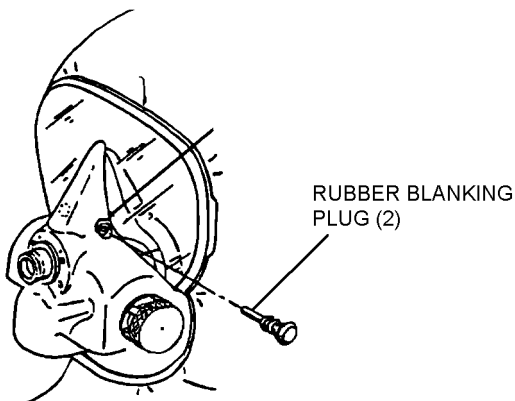
4-123. Visual Inspection.

4-124. Mask Assembly. Inspect mask assembly as follows:

WARNING

Either a nose occluder (authorized for (V)1, (V)2, (V)3 or (V)4) or butyl blanking plugs (authorized for (V)1 only) must be installed to ensure CBR protection.

1. If nose occluder is installed, inspect for damage and security of attachment. Operate nose occluder and check for full, free movement. Position stirrup in full-down position. If nose occluder is not installed, check to ensure blanking plugs are installed and fully seated in faceplate nose occluder bushings and are not damaged.



4p124s1

Step 1 - Para 4-124

CAUTION

Avoid excessive stretching of the neck seal when inverting hood to inspect internal components. Damaged neck seals may not be repaired or replaced.

2. Carefully fold hood inside out to expose orinal mask.

WARNING

The presence of foreign matter in mask may degrade its performance and subject wearer to contamination.

3. Inspect for the presence of foreign matter. If foreign matter is present, mask shall be thoroughly cleaned before use in accordance with [paragraph 4-206](#).

4. Clean inner lens area in accordance with [paragraph 4-207](#) and allow to dry completely. When dry,

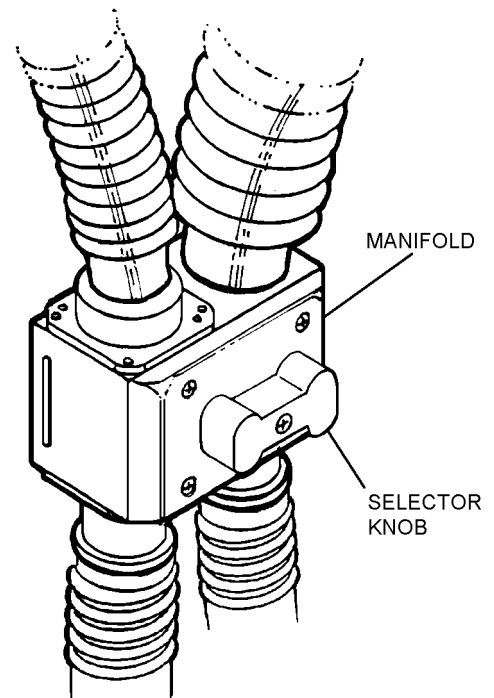
apply anti fogging compound to the lens and allow to completely dry. Return hood to its normal position.

5. Inspect toggle harness for security of attachment and proper operation.

6. Clean outer lens area in accordance with [paragraph 4-207](#) and allow to dry thoroughly. Apply anti fogging compound to the outer lens and allow to dry.

- 4-125. Lower Assembly. Inspect the lower assembly as follows:

1. Inspect the H-manifold to ensure selector knob moves freely.



4p125s1

Step 1 - Para 4-125

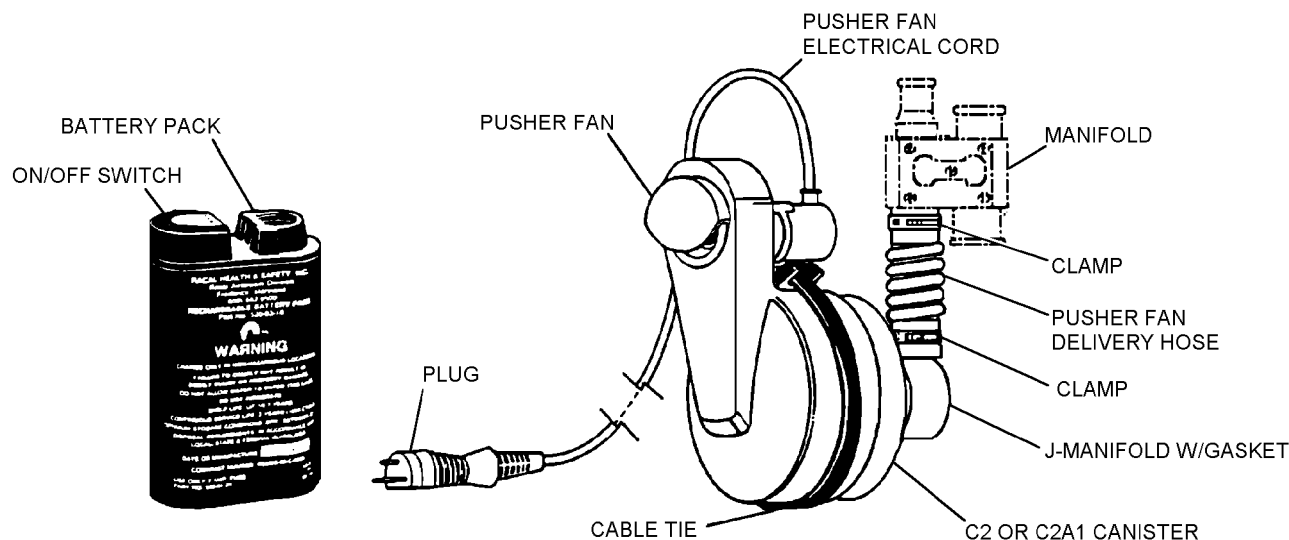
2. Inspect pusher fan subassembly as follows:

- a. Ensure both ends of pusher fan delivery hose are secured with stepless low profile clamps; one to H-manifold right-side inlet port and one to J-manifold. Carefully check hose for damage.

CAUTION

If hose is damaged, it must be removed and replaced.

- b. Inspect J-manifold gasket. If damage or deterioration is evident, replace with a new gasket. Install new gasket in accordance with [paragraph 4-221, step 7](#).



Step 2 - Para 4-125

4p125s2

c. Inspect C2 or C2A1 canister for obvious damage. If damage is noticeable or rust is found on the canister surface, a more detailed inspection shall be done in accordance with paragraph 4-220. Ensure that the C2 or C2A1 canister is securely fastened to J-manifold (fully hand-tightened).



Do not subject pusher fan power cord to excessive stress such as when disconnecting battery by pulling on cord rather than plug. Failure to firmly grasp plug itself when disconnecting battery may compromise the integrity of power cord and/or electrical connection and result in an in-flight failure.

d. Inspect pusher fan for signs of rips, tears, or obvious damage. Check fan operation by switching battery ON and rotating electrical cord at both the battery terminal and pusher fan junction. If fan fails to operate or is intermittent in operation, a more detailed inspection shall be done in accordance with paragraph 4-115. Ensure that the pusher fan is properly secured to the C2 or C2A1 canister and is in its proper orientation.

e. Inspect battery as follows:

NOTE

A fully charged NiCad battery should be used for each training flight. Refer to Chapter 6 for charging instructions. Lithium batteries shall be used for war reserve.

Replace battery pack if any of the following problems are apparent.

- (1) Battery pack case appears swollen or cracked.
- (2) Battery pack leaks fluid or any substance of any kind.
- (3) Battery pack 3-pin receptacle has become corroded, cracked, or damaged.
- (4) Battery pack case is contaminated with oil, grease or other matter.
- (5) Rubber cover of ON/OFF push switch is damaged or missing.
- (6) Fuse extractor knob is missing (NiCad only).

3. Assemble oxygen regulators as follows ((V)2 and (V)3 only):

a. (LOX) - Install LOX regulator to regulator hose. Position regulator as shown in figure 4-26. Secure with a 24.5 mm stepless low profile clamp.

b. (OBOGS) - Install OBOGS regulator to bayonet connector as shown in figure 4-27.

NOTE

For C-20/C-40 Cockpit Aircrew application, the CRU-103 must be placed in service in accordance with the 13-1-6.4 Series manual.

4. Inspect the oxygen delivery subassembly as follows ((V)2 through (V)4 only):

WARNING

If the hose is damaged, it must be removed and replaced.

a. Ensure both ends of the manifold hose are secured with stepless low profile clamps; one to the H-manifold left-side inlet port and one to the J-manifold. Carefully check the hose for damage.

b. Inspect the J-manifold gasket. If damage or deterioration is evident, replace with a new gasket. Install new gasket in accordance with paragraph 4-221, step 7.

c. Carefully inspect 90° rubber molding for damage.

d. Ensure 90° rubber molding is securely attached to C2 or C2A1 canister with cable tie.

e. (LOX) - Ensure 90° rubber molding is securely fastened to one end of 3/4 inch - 3/4 inch coupling with a 24.5 mm stepless low profile clamp. Ensure regulator hose is securely attached to the other end of the coupling with stepless low profile clamp. Ensure the other end of regulator hose is securely attached to LOX regulator with a stepless low profile clamp.

f. (OBOGS) - Ensure 90° rubber molding is securely fastened to 3-pin (MS27796) bayonet connector with a 24.5 mm stepless low profile clamp. Ensure regulator is connected.

g. (Panel Mount) - Ensure 90° rubber molding is securely fastened to quick disconnect fitting with a 24.5 mm stepless low profile clamp.

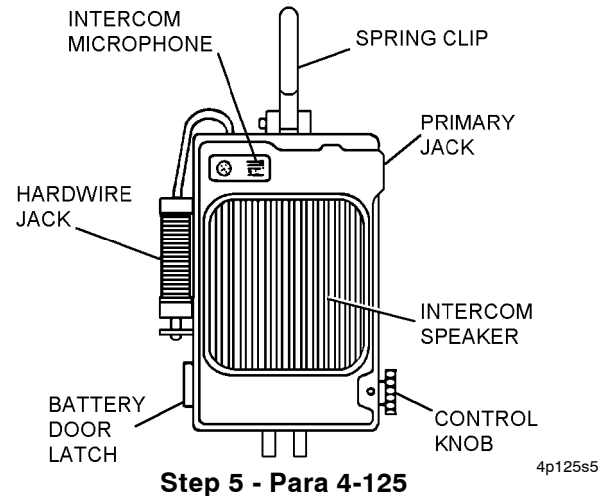
h. Inspect the LOX/OBOGS regulator assembly for dirt, corrosion, cracks, and other damage.

WARNING

If the LOX/OBOGS regulator assembly is damaged, it must be removed and replaced in accordance with NAVAIR 13-1-6.4-2.

i. Ensure seat kit hose is firmly threaded into LOX/OBOGS regulator assembly.

5. Inspect intercommunications unit as follows:



a. Ensure no mechanical damage, cracks or dents are found on intercommunications unit.

b. Communications cord and patch cord shall have no frayed wires, corroded pins or receptacles.

c. Ensure 9V battery (NIIN 00-900-2139) is not leaking fluid or any other substance.

d. Ensure mechanical integrity of intercommunications unit by checking for loose knobs, loose hardwire jack connection or a broken spring clip.

4-126. Intercom Unit Functional Test. To perform the intercom unit functional test, proceed as follows:

WARNING

Ensure intercom unit is turned off prior to removing or installing batteries. Failure to turn the intercom unit off may cause electrical arcing, resulting in fatal explosion or fire, especially in combustible atmospheres.

NOTE

The following functional test shall be performed while the aircrew is wearing the appropriate vest and flight helmet.

The AM-3597C/A amplifier, if installed, must be temporarily removed for the intercom unit to operate properly.

1. Connect intercom unit to mask microphone and aircrew helmet with the appropriate ground communications cord as indicated in table 4-2A.

2. Turn control knob, on intercom unit, to the first position - listen only.

NAVAIR 13-1-6.10

3. Talk into intercom unit and have aircrew confirm sound in helmet earphones.

NOTE

The second position, talk/listen, is the recommended position for all ground communications.

4. Turn control knob to the second position - Talk/Listen.

5. Instruct aircrew to talk and confirm sound coming from intercom speaker.

6. Talk into intercom unit and have aircrew confirm sound in helmet earphones.

7. If the intercom unit fails the functional test, replace intercom unit and repeat steps 1 through 6.

8. Secure intercom unit to the survival vest with the intercom spring clip.

4-127. Respirator Assembly Functional Test. To perform the respirator assembly functional test, proceed as follows:

NOTE

Ensure H-manifold selector knob is in the open (horizontal) position.

1. Have subject don respirator assembly with pusher fan ON.

2. Perform functional test as follows:

a. Close hood outlet valve.

b. Ensure pusher fan is ON.

c. Ensure hood inflates.

d. Open hood outlet valve to ensure proper operation. (Pusher fan air should vent through valve.)

e. Pinch-off hood inlet hose with fingers. Air should not vent through the hood outlet valve. Release hose.

f. Pinch-off mask inlet hose with fingers. Air should vent through hood outlet valve. Release hose.

g. Switch OFF pusher fan.

3. Ensure pusher fan and battery are in survival vest mounting pocket.

4-128. POSTFLIGHT INSPECTION. Postflight Inspection, consisting of visual inspection and cleaning of the A/P22P-14(V)1 through (V)4 respirator assemblies, shall be performed after each flight at Organizational Level and shall be performed by a qualified Aircrew Survival Equipmentman (PR). To perform Postflight Inspection, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Pad, Gauze	—
As Required	Water	—
As Required	Cloth, Cotton	—
As Required	Cloth, Abrasive	—
As Required	Towelettes, SANI-COM	No. 3205 (CAGE 18195)
As Required	Bleach, Laundry	A-A-1427 NIIN 00-598-7316
As Required	Cleaning Compound, Type I	MIL-C-43616
1	Brush, Acid	NIIN 00-514-2417
1	Brush, Sable	—
As Required	Cotton Swab	—
As Required	Alcohol, Isopropyl Rubbing	TT-I-735 NIIN 00-655-8366
As Required	Cloth, Chamois	—
1	Cable Tie, 3.6 mm	CL 6226

Table 4-2A. CBR Communications Matrix

Priority Aircraft	CBR Mask	Helmet/Headset	Helmet Connector	CBR Ground Communications Cord (Not E)	In-Flight Amp
F/A-18 series	A/P22P-14(V)2 or A/P22P-14(V)3	HGU-66(V)/P or HGU-68(V)/P or JHMCS or HGU-87/(V)/P22P-16	CX-4708A/AIC	CL 6597 (CX-4707C)	AM-3597C/A**
F-14 series	A/P22P-14(V)2 or A/P22P-14(V)3	HGU-68(V)/P	CX-4708A/AIC	CL 6597 (CX-4707C)	AM-3597C/A**
AV-8B	A/P22P-14(V)3	HGU-85(V)/P	CX-4708A/AIC	CL 6597 (CX-4707C)	AM-3597C/A**
EA-6B	A/P22P-14(V)2	HGU-68(V)/P	CX-4708A/AIC	CL 6597 (CX-4707C)	AM-3597C/A**
KC-130	A/P22P-14(V)4	HGU-84/5P	CX-4832A or CX-12972	CL 6922* (4832 ICU) or CL 6922* (4832 ICU) W/ Patch* (Not E)	N/R
C-2A	A/P22P-14(V)4	HGU-68(V)1	CX-4708A/AIC	CL 6597 (CX-4707C)	N/R
S-3 series	A/P22P-14(V)2	HGU-68(V)3	CX-13128/A (Not E)	CL 6922* (4832 ICU) W/ Patch* (Not E)	AM-3597C/A
E-2C	A/P22P-14(V)4	HGU-68(V)4	CX-4708A/AIC	CL 6597 (CX-4707C)	AM-3597C/A**
P-3 series	A/P22P-14(V)4	HGU-68(V)2	CX-4832A or CX-12972	CL 6922* (4832 ICU) or CL 6922* (4832 ICU) W/ Patch* (Not E)	N/R
CH-46D	A/P22P-14(V)1	HGU-84/5P	CX-4832A or CX-12972	CL 6922 (4832 ICU) or CL 6922 (4832 ICU) W/ Patch* (Not E)	N/R
CH-46E	A/P22P-14(V)1	HGU-84/6P	CX-13128/A (Not E)	CL 6922 (4832 ICU) W/ Patch* (Not E)	AM-3597C/A
AH-1W	A/P22P-14(V)1	HGU-67/P	CX-13165	CL 6922 (4832 ICU)	N/R
UH-1N	A/P22P-14(V)1	HGU-84/2P or HGU-84/3P (SAR Only)	CX-4832A or CX-12972	CL 6922 (4832 ICU) or CL 6922 (4832 ICU) W/ Patch* (Not E)	N/R
CH-53D	A/P22P-14(V)1	HGU-84/7P - pilot/copilot	CX-13165	CL 6922 (4832 ICU)	AM-3597C/A
		HGU-84/4P - crew	CX-4832A or CX-12972	CL 6922 (4832 ICU) or CL 6922 (4832 ICU) W/ Patch* (Not E)	AM-3597C/A
CH-53E	A/P22P-14(V)1	HGU-84/1P	CX-4832A or CX-12972	CL 6922 (4832 ICU) or CL 6922 (4832 ICU) W/ Patch* (Not E)	AM-3597C/A
H-3	A/P22P-14(V)1	HGU-84/5P	CX-4832A or CX-12972	CL 6922 (4832 ICU) or CL 6922 (4832 ICU) W/ Patch* (Not E)	N/R

Table 4-2A. CBR Communications Matrix (Cont)

Priority Air Tasking	CBR Mask	Helmet/Headset	Helmet Connector	CBR Ground Communications Cord (Not E)	In-Flight Amp
SH-60 series	A/P22P-14(V)1	HGU-84/6P	CX-13128/A (Not E)	CL 6922 (4832 CU) W/Patch* (Not E)	AM-3597C/A
C-9 (Not E)	A/P22P-14(V)4	Headset CE 115711-8	4-172/U	CL 6597 (CX-4707C)	AM-3597C/A**
C-20 (Not E)	A/P22P-14(V)3 or (V)4	Microphone Wire (Not E) B/E Aerospace P/N 179002-48	N/A	CL 6597 (CX-4707C)	AM-3597C/A**
C-40 (Not E)	A/P22P-14(V)3 or (V)4	Microphone Wire (Not E) B/E Aerospace P/N 179002-48	N/A	CL 6597 (CX-4707C)	AM-3597C/A**

- Notes:
1. Ground communications cords are supplied within each respirator assembly transit case. If the correct cord is not supplied, it must be ordered through normal supply channels. These cords are designed to operate with the A/P22P-14(V)1 through (V)4 Respirator Assembly intercom units only. In-flight communications cords shall be utilized from existing helmets and oxygen masks, as applicable.
 2. The M22442/19-1 (CX-12972/AR) Communication Cable is an authorized alternative for the M22442/28-1 (CX-13128/A) Communication Cable.
 3. Patch denotes Patch Cord (NIIN 01-355-8019).
 4. Aft aircrew will use ground intercommunication unit and cords for in-flight and ground communication. To conserve battery life, intercommunication unit shall remain in OFF position until required.
 5. Microphone wire is used in conjunction with standard headset.

Legend:

- * Denotes that this item must be requisitioned through normal supply channels if not available with the existing CBR system.
- ** Denotes that this item must be requisitioned through normal supply channels if not used during day to day flight operations.

Support Equipment Required

Quantity	Description	Reference Number
1	Pliers, Side Cutting, 4-inch	—
1	Cable Tie Tool, Standard	MS90387-1

4-129. Visual Inspection.

4-130. Mask Assembly. Inspect mask assembly as follows:

- 1. Hood assembly for damage, deterioration and security of bonded joints. Invert hood for thorough inspection of hood internal sections.
- 2. Orinasal mask for damage, deterioration of seal edge, and to the area of rubber swept by nose occluder shaft assemblies.
- 3. Orinasal mask deflector plate for damage and security of attachment.
- 4. Inhalation valve assembly for damage, security of attachment, and correct position. (Lug slots should be at right angles to mark in orinasal mask.)
- 5. Iceguard for damage and blockage. Refit. Ensure it is in locked position. (Arrow engraved on body should point towards compensated exhalation valve.)
- 6. Compensated exhalation valve for damage and correct fitting.
- 7. Hood cowl padding strip for damage, deterioration, and security of attachment.
- 8. Restore hood to normal position.
- 9. Snout for damage and security of attachment.
- 10. Nose occluder for damage and security of attachment. Operate nose occluder and check for full, free movement. Position stirrup in full-down position. If nose occluder is not installed, check to ensure blanking plugs are fully seated in faceplate nose occluder bushings and are not damaged.
- 11. Toggle harness for damage and security of attachment. Operate toggle harness and check for full, free movement.

- 12. Microphone assembly for security of attachment. Check connecting lead for fraying. Check plug condition.
 - 13. Hood outlet valve for damage and security of attachment.
 - 14. Hood inlet hose and mask inlet hose for damage and security of attachment. Ensure the lie of hoses is satisfactory.
 - 15. Anti-suffocation disconnect for security of connection and correct locking.
 - 16. Mask inlet adapter for damage and security of attachment. Where failure of bonded joint is evident, remove mask inlet adapter as detailed in paragraph 4-171. Install as detailed in paragraph 4-231.
 - 17. Inspect interior of mask assembly for excessive dirt, sand, dried liquid nourishment, or vomit. The mask shall be disassembled and all component parts cleaned in accordance with paragraph 4-192 if any foreign matter is present.
- 4-131. Lower Assembly. Inspect lower assembly as follows:
- 1. Inspect the H-manifold to ensure selector knob moves freely.
 - 2. Inspect pusher fan subassembly as follows:



If hose is damaged, it must be removed and replaced.

- a. Ensure both ends of H-manifold hose are secured with stepless low profile clamps; one to H-manifold right-side inlet port and one to J-manifold. Carefully check hose for damage.
- b. Remove and inspect the J-manifold gasket. If damage or deterioration is evident, replace with a new gasket. Reinstall new gasket in accordance with paragraph 4-221, Step 7.
- c. Inspect C2 or C2A1 canister for obvious damage. If damage is noticeable or rust is found on the canister surface, a more detailed inspection shall be done in accordance with paragraph 4-220. Ensure that the canister is securely fastened to the J-manifold (fully hand-tightened).

WARNING

Do not subject pusher fan power cord to excessive stress such as when disconnecting battery by pulling on cord rather than plug. Failure to firmly grasp the plug itself when disconnecting battery may compromise integrity of power cord and/or electrical connection and result in an in-flight failure.

d. Inspect the pusher fan for signs of rips, tears, or obvious damage. Check fan operation by switching the battery ON and rotating the electrical cord at both the battery terminal and pusher fan junction. If the fan fails to operate or is intermittent in operation, a more detailed inspection shall be done in accordance with [paragraph 4-115](#). Ensure that the pusher fan is properly secured to the canister and is in its proper orientation.

e. Inspect battery as follows:

NOTE

Replace the battery pack if any of the following problems are apparent.

- (1) Battery pack case appears swollen or cracked.
- (2) Battery pack leaks fluid or any substance of any kind.
- (3) Battery pack 3-pin receptacle has become corroded, cracked, or damaged.
- (4) Battery pack case is contaminated with oil, grease or other matter.
- (5) Rubber cover of ON/OFF push switch is damaged or missing.
- (6) Fuse extractor knob is missing (NiCad only).

3. Inspect oxygen delivery subassembly ((V)2 thru (V)4 only) as follows:

WARNING

If hose is damaged, it must be removed and replaced.

a. Ensure both ends of hose are secured with stepless low profile clamps; one to H-manifold left-side inlet port and one to J-manifold. Carefully check hose for damage.

b. Remove and inspect J-manifold gasket. If damage or deterioration is evident, replace with a new gasket. Reinstall new gasket in accordance with [paragraph 4-221, step 7](#).

c. Carefully inspect the 90° rubber molding for damage.

d. Ensure the 90° rubber molding is securely attached to the C2 or C2A1 canister with an applicable cable tie.

e. (LOX variant) - Ensure 90° rubber molding is securely fastened to one end of 3/4 inch - 3/4 inch coupling with a stepless low profile clamp. Ensure regulator hose is securely attached to the other end of coupling with a stepless low profile clamp. Ensure opposite end of regulator hose is securely attached to LOX regulator with a stepless low profile clamp.

f. (OBOGS variant) - Ensure 90° rubber molding is securely fastened to 3-pin (MS27796) bayonet connector with a stepless low profile clamp.

g. (Panel Mount variant) - Ensure 90° rubber molding is securely fastened to quick disconnect fitting with a stepless low profile clamp.

WARNING

If the LOX/OBOGS regulator assembly is damaged, it must be removed and replaced.

h. Inspect the LOX/OBOGS regulator assembly for dirt, corrosion, cracks, and other damage.

i. Ensure seat kit hose is firmly threaded into the LOX/OBOGS regulator assembly.

4. Inspect intercommunications unit as follows:

- a. Ensure no mechanical damage, cracks or dents are found on unit.
- b. Communications cord and patch cord shall have no frayed wires, corroded pins or receptacles.
- c. Ensure battery is not leaking fluid or any other substance.

d. Ensure mechanical integrity of intercommunications unit by checking for loose knobs, loose hardwire jack connection or a broken spring clip.

4-132. Cleaning. Clean respirator assembly in accordance with [paragraph 4-120](#).

4-133. Transit and Ready for Use Storage. Following cleaning, pack respirator assembly in accordance with [paragraph 4-101](#).

NOTE

Special Inspection of the respirator assembly does not commence until the respirator assembly is removed from its vacuum sealed foil bag.

4-134. SPECIAL INSPECTION. The Special Inspection shall be performed on the A/P22P-14(V)1 through (V)4 respirator assemblies by a qualified Aircrew Survival Equipmentman (PR) at 90-day intervals for CBR assemblies being used for training, and every 270 days for those assemblies placed in service for operational use. The inspection shall include Visual Inspection, battery voltage check, bench testing, and cleaning of all assemblies and their component parts where specified. The battery shall be inspected in accordance with Chapter 6, and the oxygen regulator shall be special inspected in accordance with NAVAIR 13-1-6.4. Organizational Level Maintenance (O level) shall route all assemblies and their component parts to Intermediate Level Maintenance (I level) for Visual Inspection, bench testing, and cleaning where specified.

Materials Required		
Quantity	Description	Reference Number
As Required	Pad, Gauze	—
As Required	Swab-Cotton	—
As Required	Towelettes, SANI-COM	No. 3205 (CAGE 18195)
As Required	Bleach, Laundry	A-A-1427 NIIN 00-598-7316
As Required	Water	—
As Required	Alcohol, Isopropyl Rubbing	TT-I-735 NIIN 00-655-8366
As Required	Cleaning Compound, Type I	MIL-C-43616
As Required	Cloth, Chamois	—
As Required	Cloth, Cotton	—
1	Brush, Acid	NIIN 00-514-2417
1	Brush, Sable	—

- 1. Unpack respirator assembly in accordance with paragraph 4-107.
- 2. Visually inspect respirator assembly in accordance with paragraph 4-113.

- 3. Perform bench test on respirator assembly in accordance with paragraph 4-138.
- 4. Clean respirator assembly in accordance with paragraph 4-120.

NOTE

Rubber products have a natural memory and may develop permanent wrinkles or folds over a period of time when stored wrinkled or folded.

- 5. Stow respirator assembly. Carefully place the respirator assembly in its transit case with as few folds and wrinkles as possible. Secure with retaining straps as illustrated on the transit case lid.
- 6. Document in accordance with OPNAVINST 4790.2 Series.

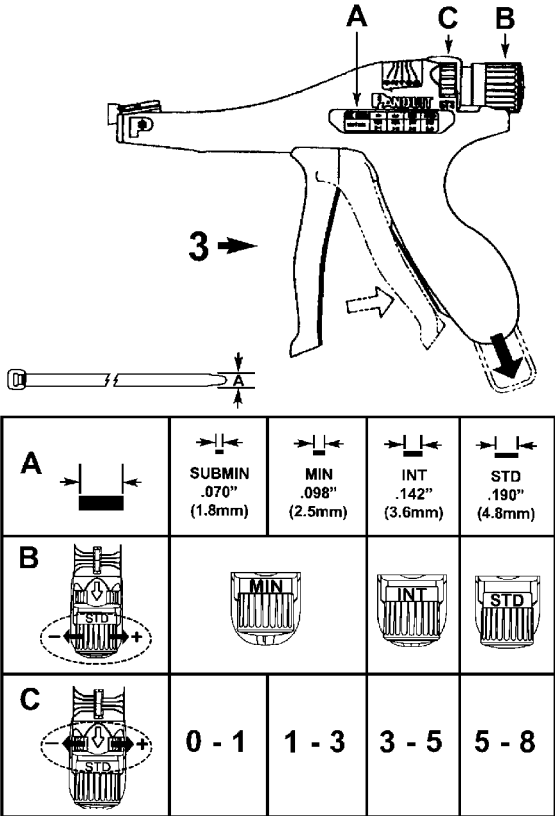
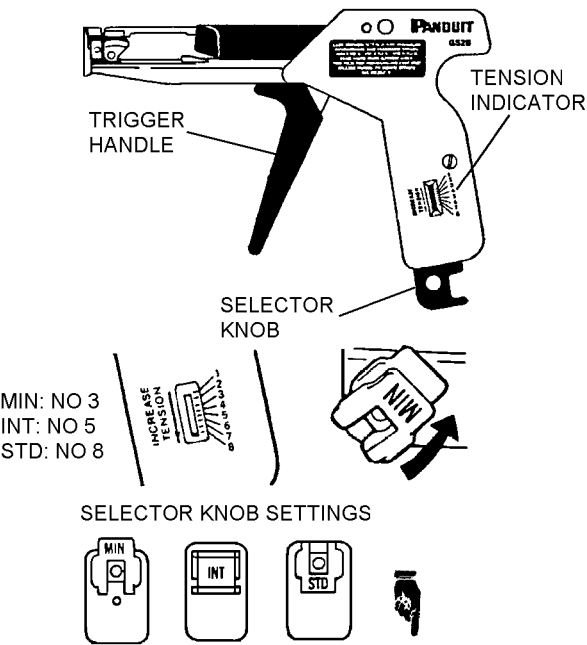
4-135. CABLE TIE AND STEPLESS LOW PROFILE CLAMP INSTALLATION PROCEDURES.

4-136. CABLE TIE INSTALLATION. The following cable tie installation procedures shall be used as required.

Materials Required		
Quantity	Description	Reference Number
1	Cable Tie, 2.4 mm	CL 6225
1	Cable Tie, 3.6 mm	CL 6226
1	Cable Tie, 4.8 mm	CL 6227
Support Equipment Required		
Quantity	Description	Reference Number
1	Cable Tie Tool, Standard	MS90387-1
1	Cable Tie Tool, Heavy Duty	NIIN 00-937-5438
1	Pincer Tool, Low Profile	Oetiker 14100055
or		
1	Pliers, Hose Clamp	NIIN 01-073-4187
1	Pliers, Side Cutting, 4-inch	—
1	Screwdriver, 6 X 1/8 inch, Std.	—

1. Locate the selector knob on the bottom of the cable tie tool's handle and flip knob to the correct position for cable ties being installed.

2. Adjust the tension indicator on handle of tool by turning selector knob clockwise to increase tension, or counter-clockwise to decrease tension.

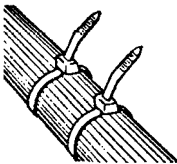


MS90387-1 SHOWN

Steps 1 and 2 - Para 4-136

4p136s1

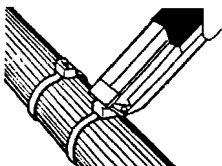
3. Loop cable tie around component to be secured, with head facing outward, and insert tip through head. Pull cable tie tight by hand. Refer to Step 4 for proper position of cable tie head on the component.



Step 3 - Para 4-136

4p136s3

4. Insert tail of cable tie into tool. With nose of tool flush to cable tie head, squeeze trigger handle. Tool will tighten cable tie and cut off excess.



Step 4 - Para 4-136

4p136s4

NOTE

Cable tie shall secure component snugly to the mask, so that inadvertent disconnection is not possible. However, at no time shall component show signs of distortion upon installation of cable tie.

4-137. STEPLESS LOW PROFILE CLAMP INSTALLATION. The following stepless low profile clamp installation procedures shall be used as required (refer to Table 4-3).

WARNING

It is critical the correct size clamp be used. Size of the clamp is marked in mm just above PAT marking on clamp.

CAUTION

Do not over expand clamp.

1. Place the low profile clamp over end of hose or tube to be clamped. The clamp may be slightly expanded to fit over end of the hose or tube.

2. Engage the lock table in slot. This is a pre-clamping position only.

Table 4-3. Cable Tie Tool, Cable Tie and Low Profile Clamp Selection Chart

Panduit or Equivalent

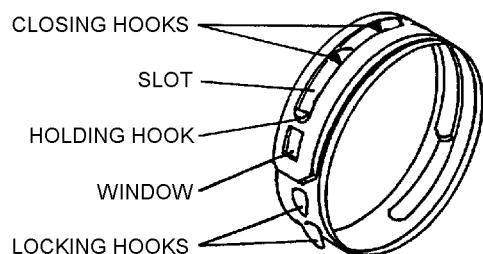
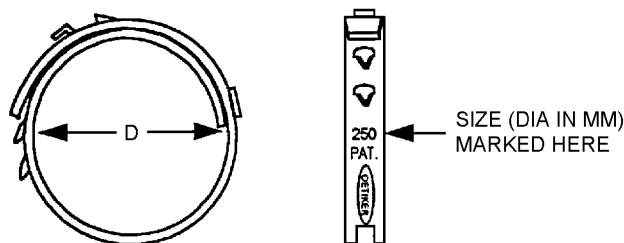
P/N GS2B (STD) MS90387-1			P/N GS4H (Heavy) NIIN 00-937-5438		
Tension	Setting	lbs	Tension	Setting	lbs
MIN INT STD	1-3 3-5 6-8	4 (18 lbs) 7 (30 lbs)	STD HVY	1-4 5-8	8 (65 lbs)

Cable Ties (with Barb)

CL P/N	Width	Application	Tension
6225	2.4 mm	Microphone, drink facility	INT (No. 4)
6226	3.6 mm	Snout, orinasal mask inhalation duct	INT (No. 4)
6227	4.8 mm	Hood inlet adapter, anti-suffocation disconnect	STD (No. 7)
6528	7.6 mm	Pusher fan and 90° rubber molding	HVY (No. 8)

Low Profile Clamps

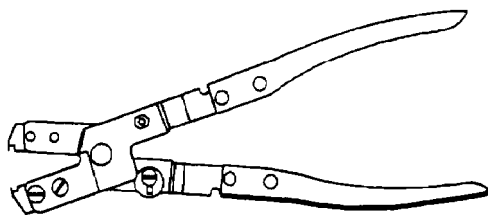
CL P/N	Dia.	Application
6592	16.5 mm	H-Manifold outlet port (right)
6593	21.9 mm	H-Manifold outlet port (left)
6670	24.5 mm	90° rubber molding, (V)2 O ₂ regulator hose, H-Manifold inlet port (left & right)
6594	26.5 mm	J-Manifolds, H-Manifold blanking cap



4p137s2

Step 2 - Para 4-137

3. Insert the pointed tips of low profile pincers into tensioning hook and tensioning tunnel.



OETIKER 14100055 OR PLIERS,
HOSE CLAMP, NIIN 01-073-4187

4p137s3

Step 3 - Para 4-137

4. Secure clamp by drawing closing hooks together. When both slot and window are directly over the hooks, press end of clamp down with thumb to engage the clamp. Release tension on tool and inspect hooks for proper engagement.

5. To remove clamp, engage tips of low profile pincers in closing hooks as in step 3 above. Draw hooks together and disengage windows from locking hooks.

4-138. BENCH TESTS.

4-139. The following are bench test procedures for testing the A/P22P-14(V)1 through (V)4 Respirator Assemblies on the A/E47T-28 Respirator Assembly Test Set only. Procedures for testing the digital test set are contained in the NAVAIR 17-15HB-21 manual. Bench tests shall be performed by a qualified Aircrew Survival Equipmentman (PR) with the portable test set - A/E47T-28, Meggitt Avionics Ltd., Part No. 6200005. The tests shall be performed as close to normal temperature and pressure conditions (NTP) as possible (+15 °C and 760 mm Hg) and maintained throughout each test. Changes in temperature and pressure during testing may affect digital manometer readings. All pressures quoted are gage pressure (that pressure difference above standard atmospheric pressure). Testing of the portable test set shall be performed (in sequence) prior to testing any part of the respirator assembly.

NOTE

A Technical Data Indoctrination Package is available for the CBR Respirator Test Set A/E47T-28, PIN# 113914. It is available in VHS, CD, DVD or electronically on the PMA-202 Website [HTTPS://pma202.navair.navy.mil/](https://pma202.navair.navy.mil/). For further information, contact your FAILSAFE Representative or Aeromedical Safety Officer.

Before any of the following bench tests can be performed, a dc power supply shall be acquired that is capable of providing an output of 3.75 Vdc at 1 amp. If a dc power supply is not available, a fully charged NiCad battery pack (P/N 3297AS601-1) shall be utilized. (Charging instructions are contained in Chapter 6. If a NiCad battery pack is not available, or time does not permit charging, a Lithium Battery pack (P/N 3297AS601-2) may be used instead.

Prior to testing the A/P22P-14(V)1 through (V)4 Respirator Assembly, the Digital Test Set (A/E47T-28) (figure 4-70) shall have successfully passed its functional tests as specified in NAVAIR 17-15HB-21.

Where specified, test results shall be recorded on the Performance Test Sheet (figure 4-73).

Blanks and adapters referred to in the following text are illustrated in figures 4-71 and 4-72.

4-139A. ADAPTER M REPAIR.

1. If black ring is loose on adapter M, note the location and position of the black ring.
2. Remove the black ring and sand old epoxy off the adapter and black ring.
3. Wipe adapter and black ring clean and free from dust.
4. Make sure areas are free from dust, oil and grease.
5. Mix epoxy per instructions (Epi Seal 20-20 or equivalent NIIN 00-738-6429).
6. Apply epoxy to the inside of black ring with the large screw opening going on first.

7. Put black ring on the adapter in the proper location.

8. Wipe excess epoxy from the adapter using isopropyl alcohol, methyl isobutyl ketone (MIBK), mineral spirits or paint thinner.

9. Let cure overnight before using.

4-140. PUSHER FAN. The Pusher Fan (figure 4-22) consists of a molded rubber boot, housing, and an internal centrifugal fan. The large, open end of the rubber boot fits over the C2 or C2A1 canister and is secured with a cable tie. An electrical cord connects the fan to a rechargeable NiCad battery pack or disposable Lithium battery pack. The NiCad battery pack provides 3-4 hours of operation (at ambient temperatures) while the Lithium battery pack provides 10-12 hours. The NiCad battery pack is designed to be used for proficiency training while the Lithium is intended for war reserve. An On/Off switch is located on the top of the battery.

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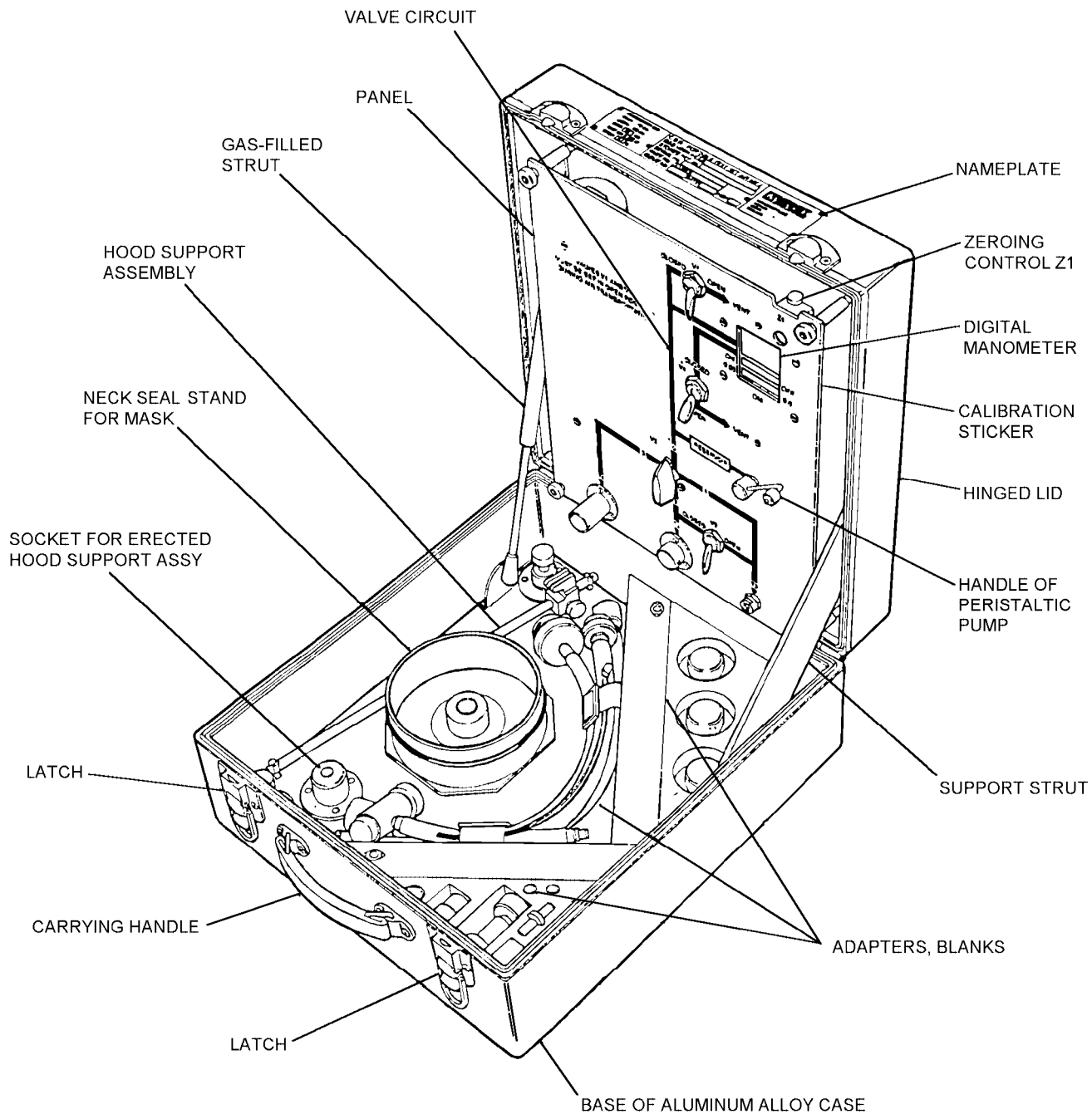
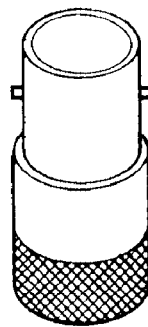


Figure 4-70. Respirator Assembly Test Set - A/E47T-28



BLANK B1



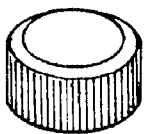
BLANK B2



BLANK B3



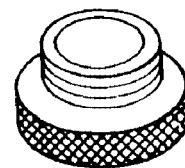
BLANK B4



BLANK B5



BLANK B6



BLANK B7

BLANKS NOT DRAWN TO SCALE

Figure 4-71. Respirator Assembly Test Set - A/E47T-28 - Blank Selection

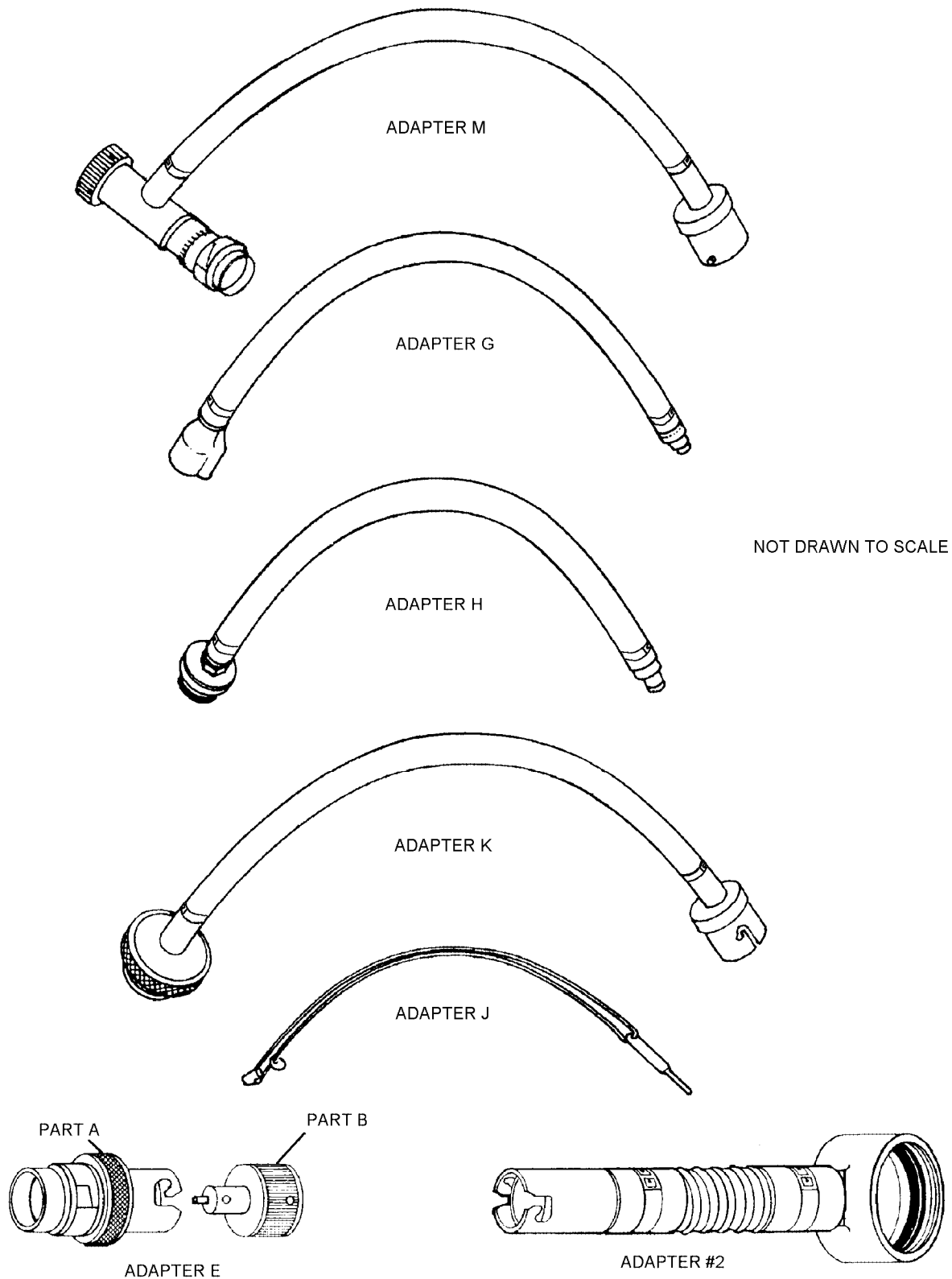


Figure 4-72. Respirator Assembly Test Set - A/E47T-28 - Adapter Selection

4-72

NAVAIR 13-1-6.10

PERFORMANCE TEST SHEET

DATE _____ VARIANT TYPE: _____
OPERATOR: _____ MASK P/N: _____
MASK S/N: _____
DIGITAL TEST SET S/N: _____

THE DIGITAL TEST SET SHALL HAVE SUCCESSFULLY PASSED ITS TEST BEFORE PERFORMING ANY OF THE FOLLOWING TESTS:

PUSHER FAN - PRESSURE TEST

REQUIRED READING	ACTUAL READING
2.6 IN. H ₂ O OR HIGHER	

NOTE: BEFORE PROCEEDING, THE PUSHER FAN MUST HAVE PASSED THE PRESSURE TEST.

INHALATION & HOOD INLET VALVE - REVERSE LEAKAGE TEST

REQUIRED READING	ACTUAL READING @ T = 7 SEC.
BETWEEN -2 AND -4 IN. H ₂ O	

H-MANIFOLD INLET VALVE - REVERSE LEAKAGE TEST

REQUIRED READING	ACTUAL READING @ T = 7 SEC.
BETWEEN -2 AND -4 IN. H ₂ O	

EXHALATION OUTLET VALVE - REVERSE LEAKAGE TEST

REQUIRED READING	ACTUAL READING @ T = 12 SEC.
BETWEEN 0.5 AND 1.0 IN. H ₂ O	

Figure 4-73. Performance Test Sheet (Sheet 1 of 2)

COMPENSATED EXHALATION VALVE - FUNCTIONAL TEST

	REQUIRED READING	ACTUAL READING	DOES AIR VENT?
1	2.6 IN. H ₂ O OR HIGHER		
	NOT MORE THAN 1.5 IN. H ₂ O		
2	2.6 IN. H ₂ O OR HIGHER		
	NOT MORE THAN 1.5 IN. H ₂ O		
3	2.6 IN. H ₂ O OR HIGHER		
	NOT MORE THAN 1.5 IN. H ₂ O		

MASK ASSEMBLY - OVERALL LEAKAGE TEST

REQUIRED READING	ACTUAL READING
BETWEEN 1.95 AND 2.0 IN. H ₂ O	

NOTE: THE FOLLOWING TEST IS ONLY TO BE PERFORMED AS A BACKUP TEST TO THE MASK ASSEMBLY - OVERALL LEAKAGE TEST IN HELPING TO ISOLATE A DEFICIENCY

HOOD ASSEMBLY - OVERALL LEAKAGE TEST

REQUIRED READING	ACTUAL READING
BETWEEN 1.95 AND 2.0 IN. H ₂ O	

CIRCLE ONE: PASS OR FAIL, IF FAIL, LIST REASONS BELOW:

Figure 4-73. Performance Test Sheet (Sheet 2 of 2)

NOTE

A power supply adapter, P/N 3297AS623-1, (figure 4-74) is recommended for use during all tests requiring a Pusher Fan. If the power supply adapter is not available, the pusher fan can be wired directly to the external power supply (figure 4-75).

4-141. Pressure Test.

1. If attached, remove pusher fan from mask's J-manifold.

NOTE

Ensure J-manifold gasket is seated in base of J-manifold.

2. Attach Adapter #2 to pusher fan.
3. With external power supply in the ON position, set output to 3.75 Vdc at 1 amp.
4. Turn external power supply OFF.
5. If using power supply adapter, connect test leads from power supply to power supply adapter and plug pusher fan into power supply adapter.
6. If not using power supply adapter, connect test leads to pins of pusher fan plug as shown in figure 4-75. If a dc power supply is not available, connect battery to pusher fan plug.

7. Connect free end of adapter #2 to T2.
8. Close V1 and V3.
9. Set V4 to OPEN.
10. Set V2 to 2.
11. Turn ON power supply. Allow pusher fan to stabilize for a period of 1 minute before taking a reading.
12. Manometer reading shall be no less than 2.6 in. H₂O. Record results on Performance Test Sheet. If the reading is not 2.6 in. H₂O or higher refer to table 4-4, Respirator Assembly Troubleshooting.
13. Turn off power supply.

14. Remove adapter #2 from T2.
15. Remove adapter #2 from pusher fan.
16. Disconnect pusher fan plug.

4-142. A/P22P-14(V)1 THROUGH (V)4 RESPIRATOR ASSEMBLIES.

NOTE

The digital test set and pusher fan shall have successfully passed its test prior to performing the following mask tests.

The following tests shall be performed in the order in which they appear.

The following items are required for bench testing the mask:

Materials Required

Quantity	Description	Reference Number
As Required	Leak Detection Compound	MIL-L-25567
As Required	Paper, Absorbent	—
1	Cable tie, 3.6 mm	CL 6226
1	Brush, 1 inch	—
As Required	Latex Coating, SPRAYLAT A	NIIN 00-598-5941

Support Equipment Required

Quantity	Description	Reference Number
1	Cable Tie Tool, Standard	MS90387-1
1	Test Set, Respirator Assembly, A/E47T-28	6200005

NOTE

Applying a latex coating to the outside visual area of the faceplate will help protect the faceplate from damage during testing. If time does not allow the use of SPRAYLAT latex coating, the velveteen cover shall be fitted to protect the optical area during testing.

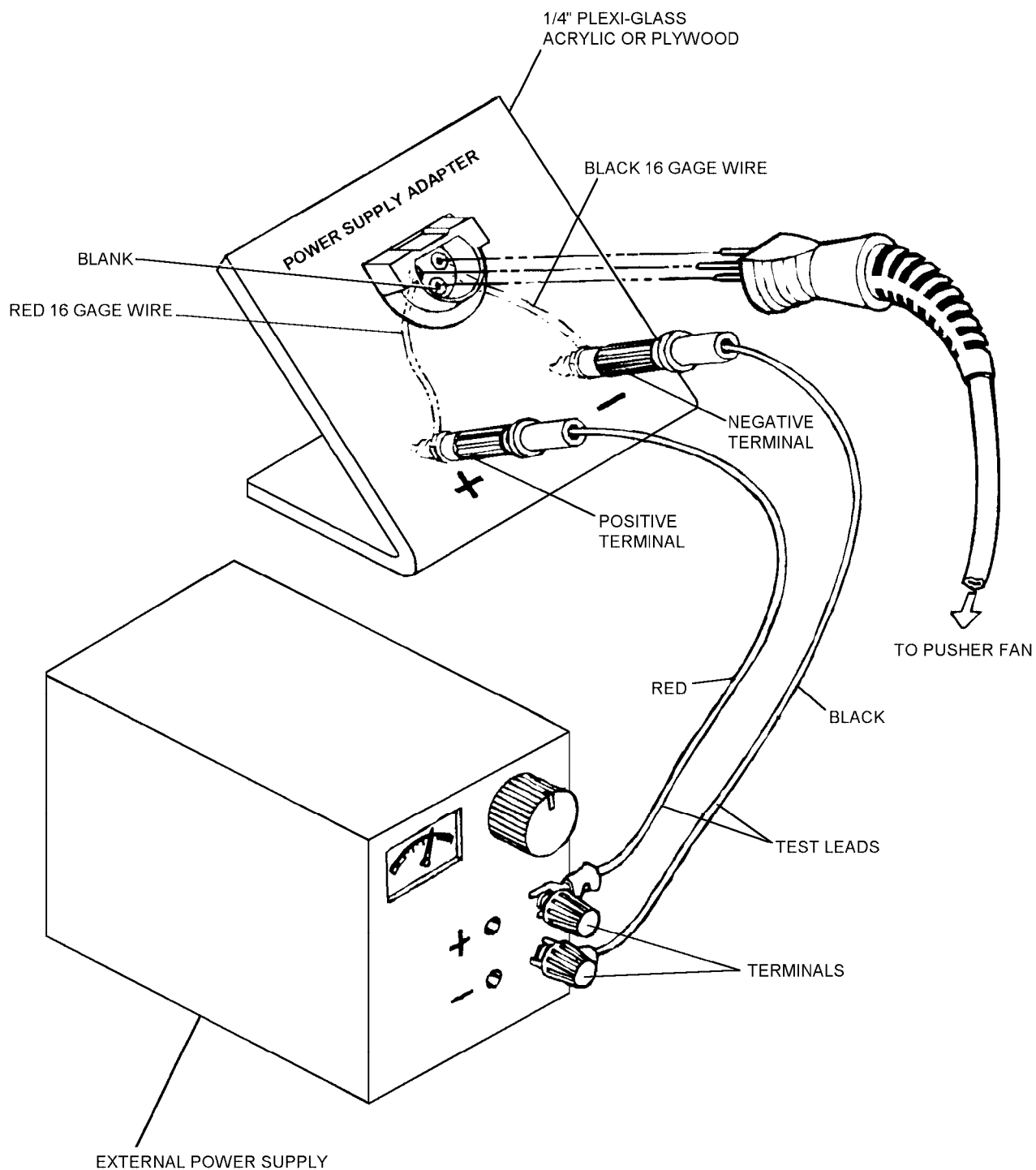


Figure 4-74. Pusher Fan Pressure Test Using Power Supply Adapter (P/N 3297AS623-1)

4-74

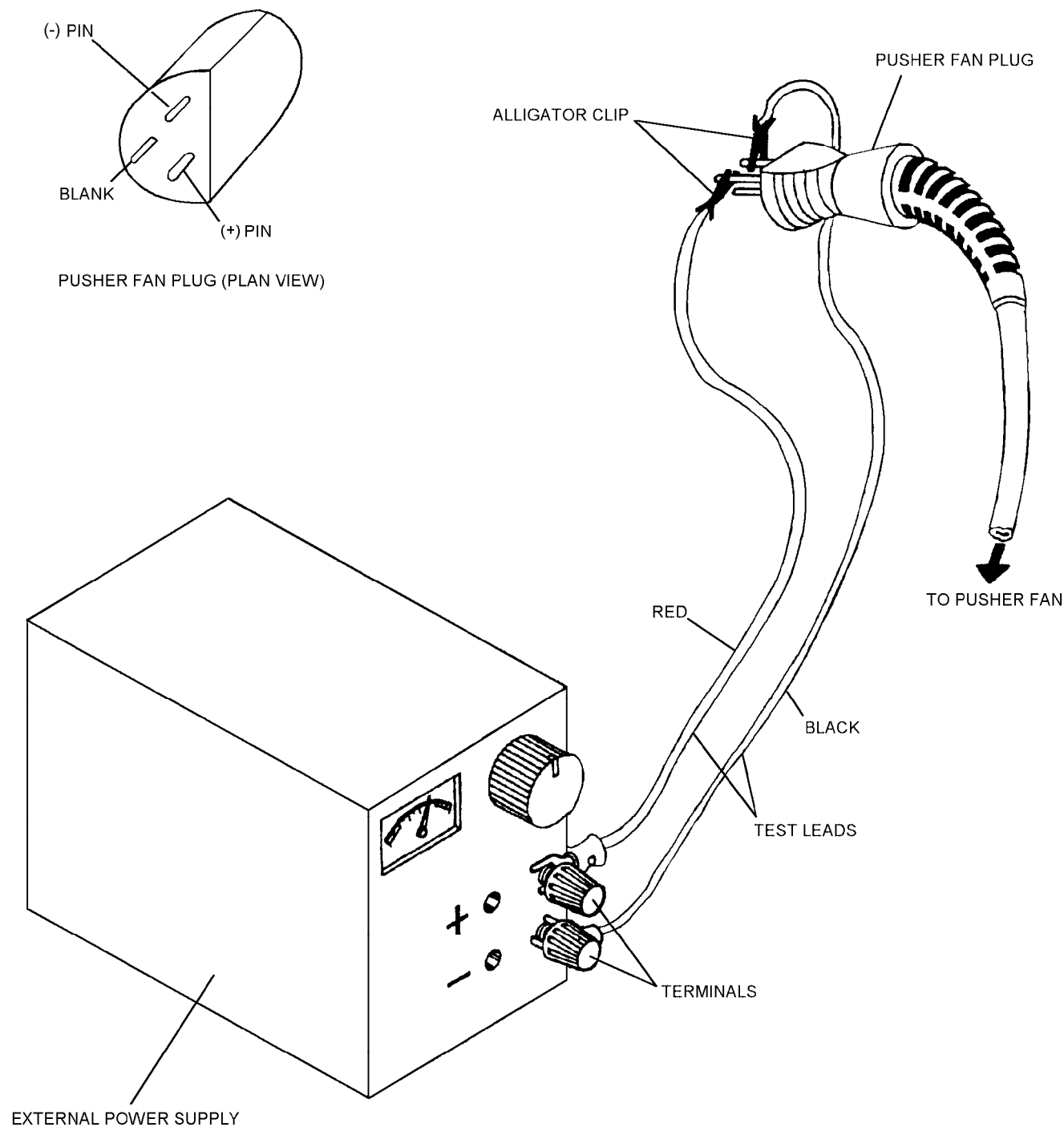


Figure 4-75. Pusher Fan Pressure Test Using Direct Wiring

4-143. Faceplate Visual Area - Protective Coating.

1. Apply an even coat of latex coating to outer visual area of faceplate using a 1 inch brush.
2. Allow coating to dry several hours, or overnight if possible. Coating turns from white to clear and becomes tough as it dries.

4-144. A/P22P-14(V)1 Respirator Assembly Only.**NOTE**

Ensure H-manifold is in the horizontal position (open) during all tests.

4-145. Inhalation and Hood Inlet Valves - Reverse Leakage Test.

1. Remove pusher fan from J-manifold.
2. Support mask toggle harness on hood support clamp (figure 4-76).
3. Remove and retain brass shear screw from anti-suffocation disconnect.
4. Disconnect anti-suffocation disconnect from mask inlet adapter.

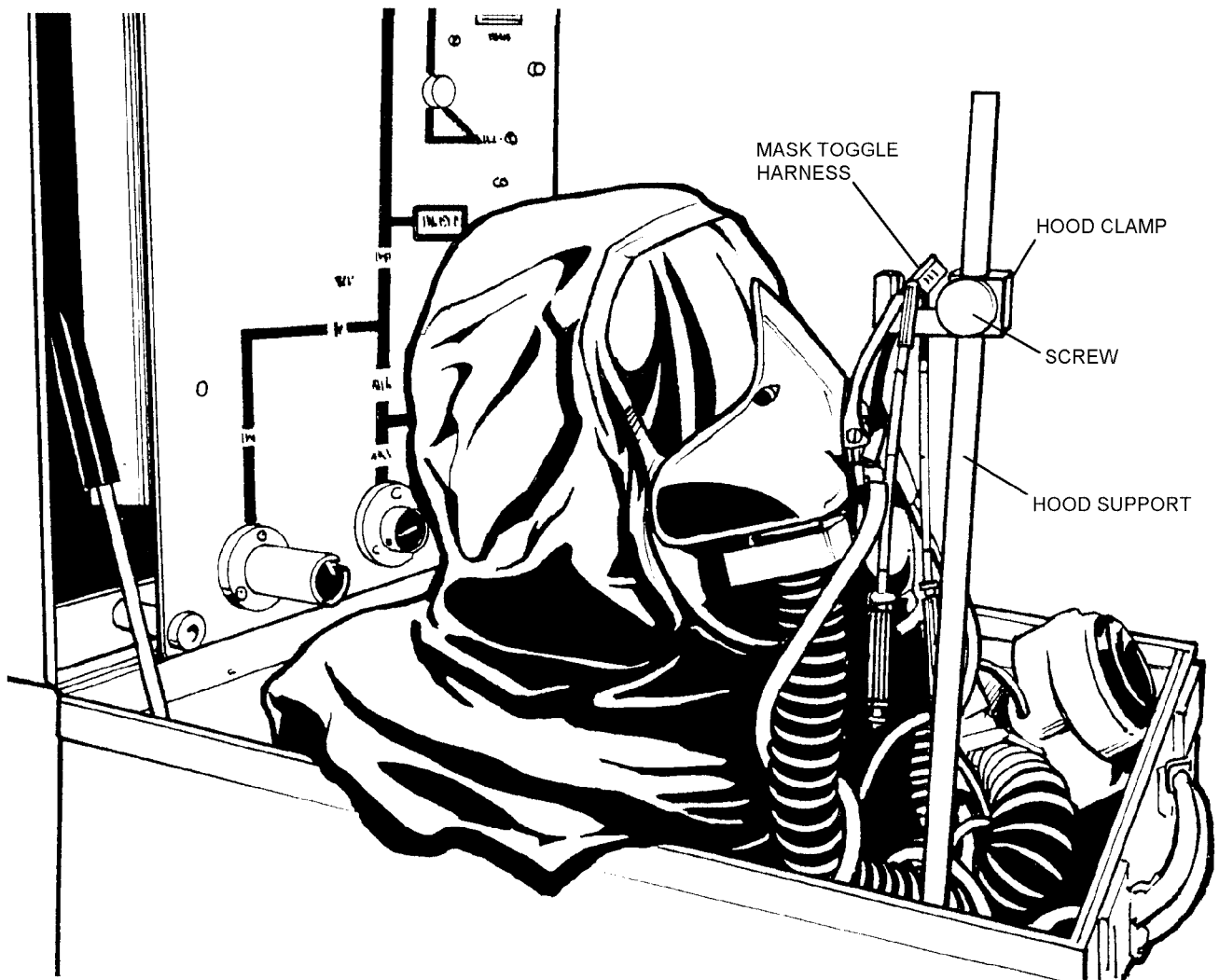


Figure 4-76. Hood Support Clamp

4-76

5. Connect adapter M between mask inlet adapter and anti-suffocation disconnect (figure 4-77).

NOTE

If blanking is close on adapter M, repair in accordance with paragraph 4-139A.

6. Connect free end of adapter M to T (figure 4-78).

7. Fit blank B7 to J-manifold.

8. Set V1 and V3 to CLOSED.

9. Set V2 to 3.

10. Ensure V4 is OPEN.

WARNING

Overpressurization will collapse stepped rubber valve into valve seat.

11. Rotate pump handle (P1) counter-clockwise until digital manometer reads -4 in. H₂O. Once the digital manometer reads -4 in. H₂O, observe and note the suction reading on digital manometer during a period of 7 seconds. Do not allow pressure to exceed -4.25 in. H₂O. Reading shall be between -2 and -4 in. H₂O. Record results on Performance Test Sheet. If reading is not between 2 and 4 in. H₂O after 7 seconds, refer to table 4-4, Respirator Assembly Troubleshooting.

12. Set V1 to OPEN.

13. Remove adapter M from T1.

14. Remove adapter M from the anti-suffocation disconnect and mask inlet adapter.

15. Remove blank B7 from J-manifold.

4-146. H-Manifold Inlet Valve - Reverse Leakage Test.

1. Ensure H-manifold selector knob is set to the OPEN (horizontal) position.

2. Connect adapter K to J-manifold and T2 (figure 4-79 and 4-80).

3. Set V1 to CLOSED.

4. Set V2 to 2.

5. Set V3 to CLOSED.

6. Ensure V4 is open.

7. Rotate pump handle (P1) counter-clockwise until digital manometer reads -4 in. H₂O. Observe and note pressure reading on digital manometer during a period of 7 seconds. Do not allow pressure to exceed -4.25 in. H₂O. Reading shall be between -2 and -4 in. H₂O. Record results on the Performance Test Sheet.

NOTE

If digital manometer does not read between -2 and -4 in. H₂O, refer to table 4-4 for troubleshooting procedures.

8. Set V1 to OPEN.

9. Remove adapter K from T2 and J-manifold.

10. Reconnect anti-suffocation disconnect to mask inlet adapter.

4-147. Exhalation Outlet Valve - Reverse Leakage Test.

1. Remove and discard cable tie from rubber snout.

2. Remove snout.

3. Invert hood and prop open compensated exhalation valve (inside original mask) using adapter J (figure 4-81).

NOTE

Wetting the O-ring on adapter H, with water will make it easier to fit the exhalation valve port. Ensure O-ring does not roll out of its seat.

4. Slowly push adapter H into exhalation valve port. Push straight-in until O-ring is no longer visible (figure 4-82).

5. Connect free end of adapter H to T3 (figure 4-83).

6. Set V1 to CLOSED.

7. Set V2 to 1.

8. Set V3 to CLOSED.

9. Set V4 to OPEN.

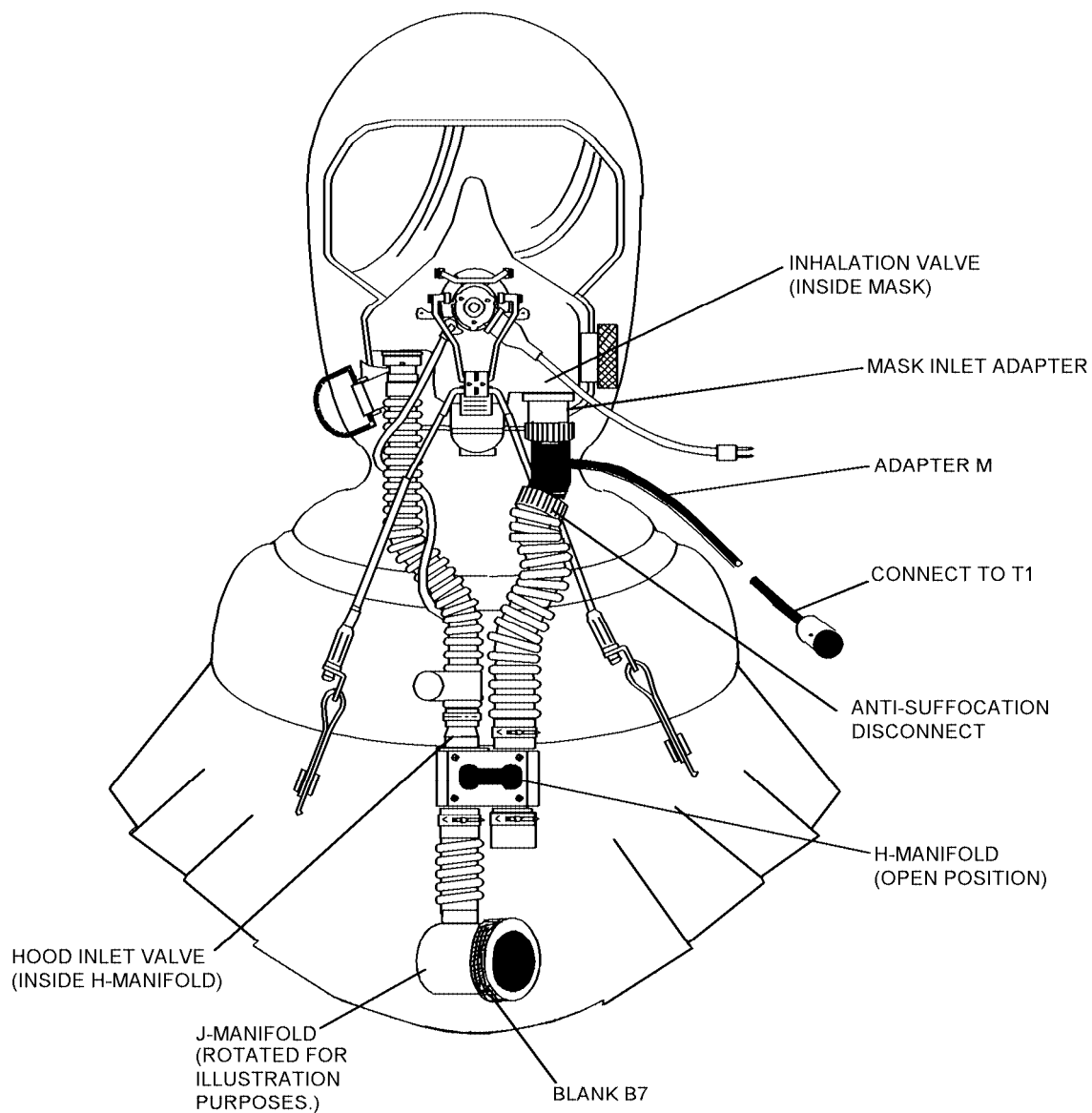


Figure 4-77. (V)1 Variant - Non-Oxygen Inhalation and Hood Inlet Valves - Reverse Leakage Test

4-77

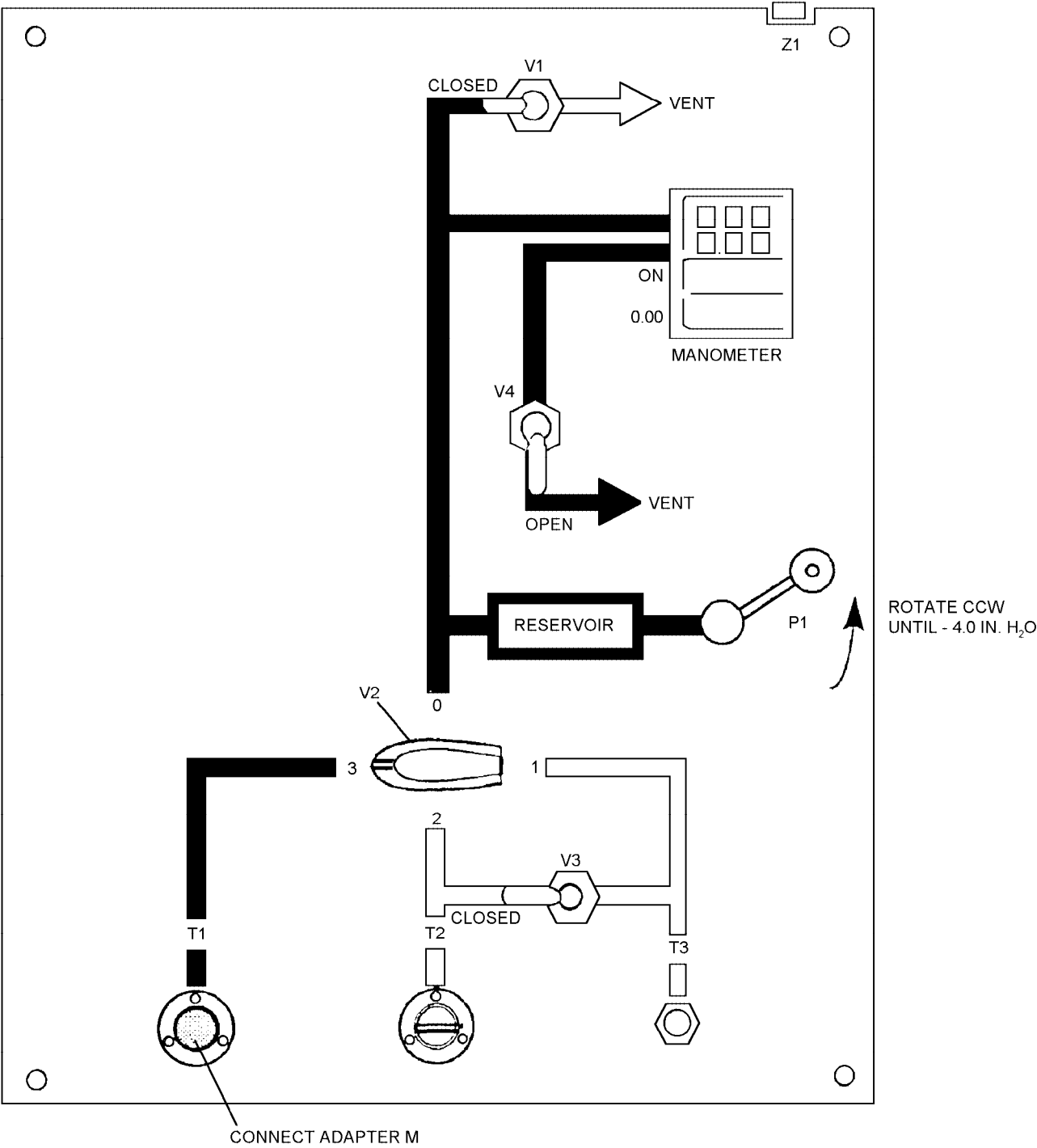


Figure 4-78. Inhalation and Hood Inlet Valves - Reverse Leakage Test

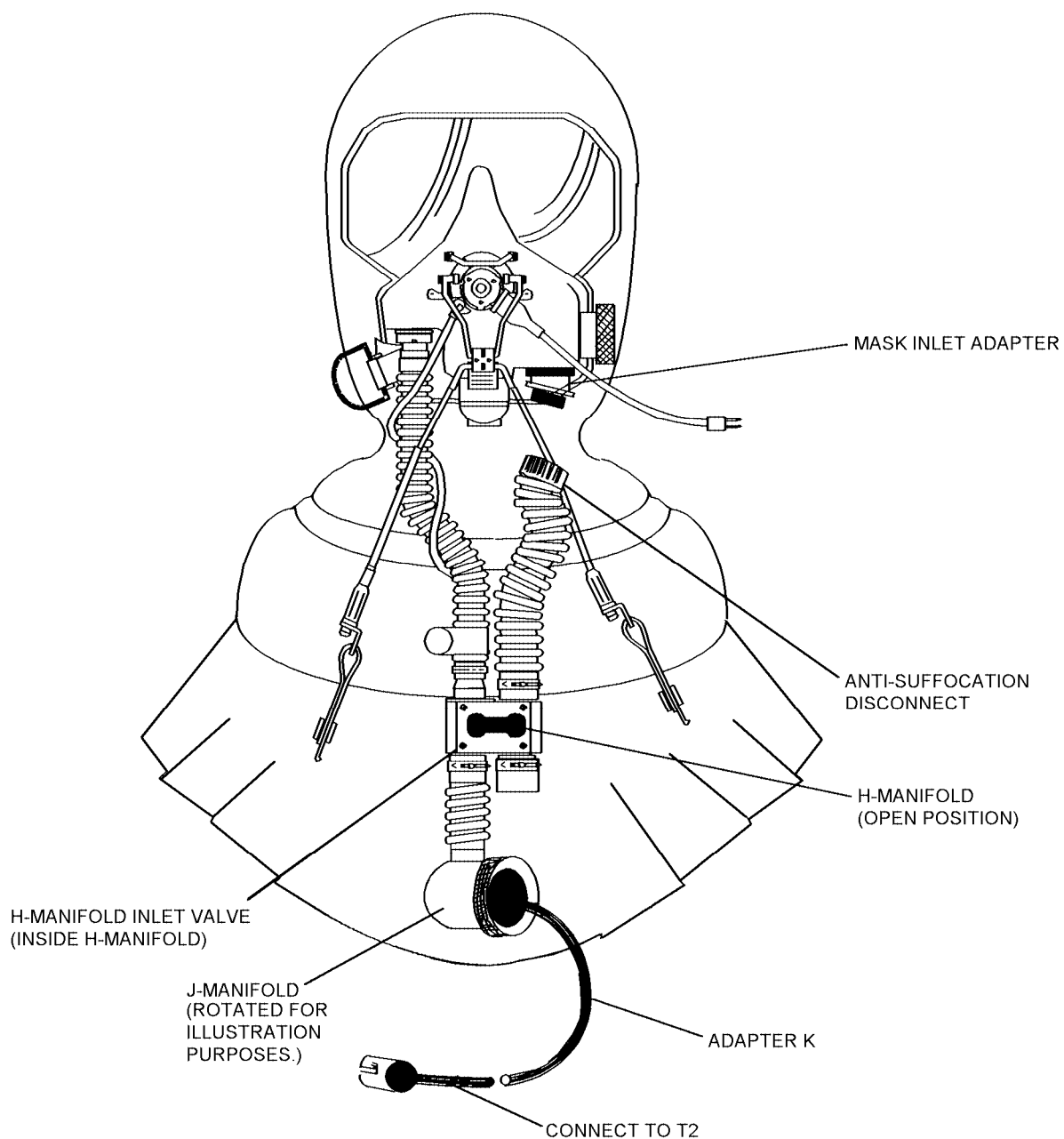


Figure 4-79. (V)1 Variant - Non-Oxygen H-Manifold Inlet Valve - Reverse Leakage Test

4-79

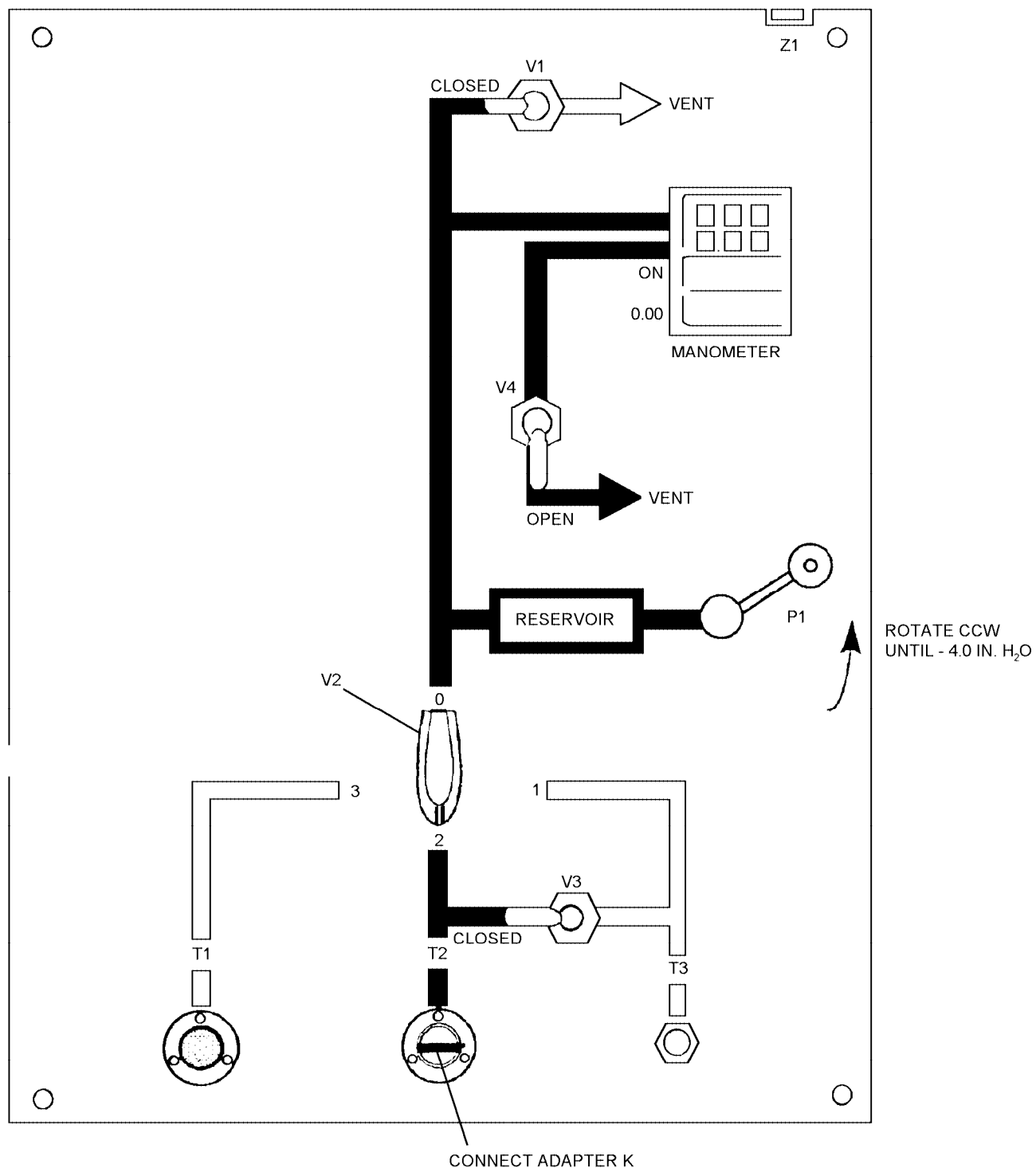


Figure 4-80. H-Manifold Inlet Valve - Reverse Leakage Test

4-80

10. Very slowly, rotate pump handle (P1) clockwise until digital manometer reads 1 in. H₂O. Once the digital manometer reaches 1 in. H₂O, observe and note the pressure reading during a 12 second period. The digital manometer reading shall be between 0.5 and 1.0 in. H₂O. Record results on Performance Test Sheet. If reading is not between 0.5 and 1.0 in. H₂O after 12 seconds, refer to [table 4-4](#), Respirator Assembly - Troubleshooting.

11. Set V1 to OPEN.

12. Remove adapter H from T3 and exhalation valve port.

13. Remove adapter J from the compensated exhalation valve.

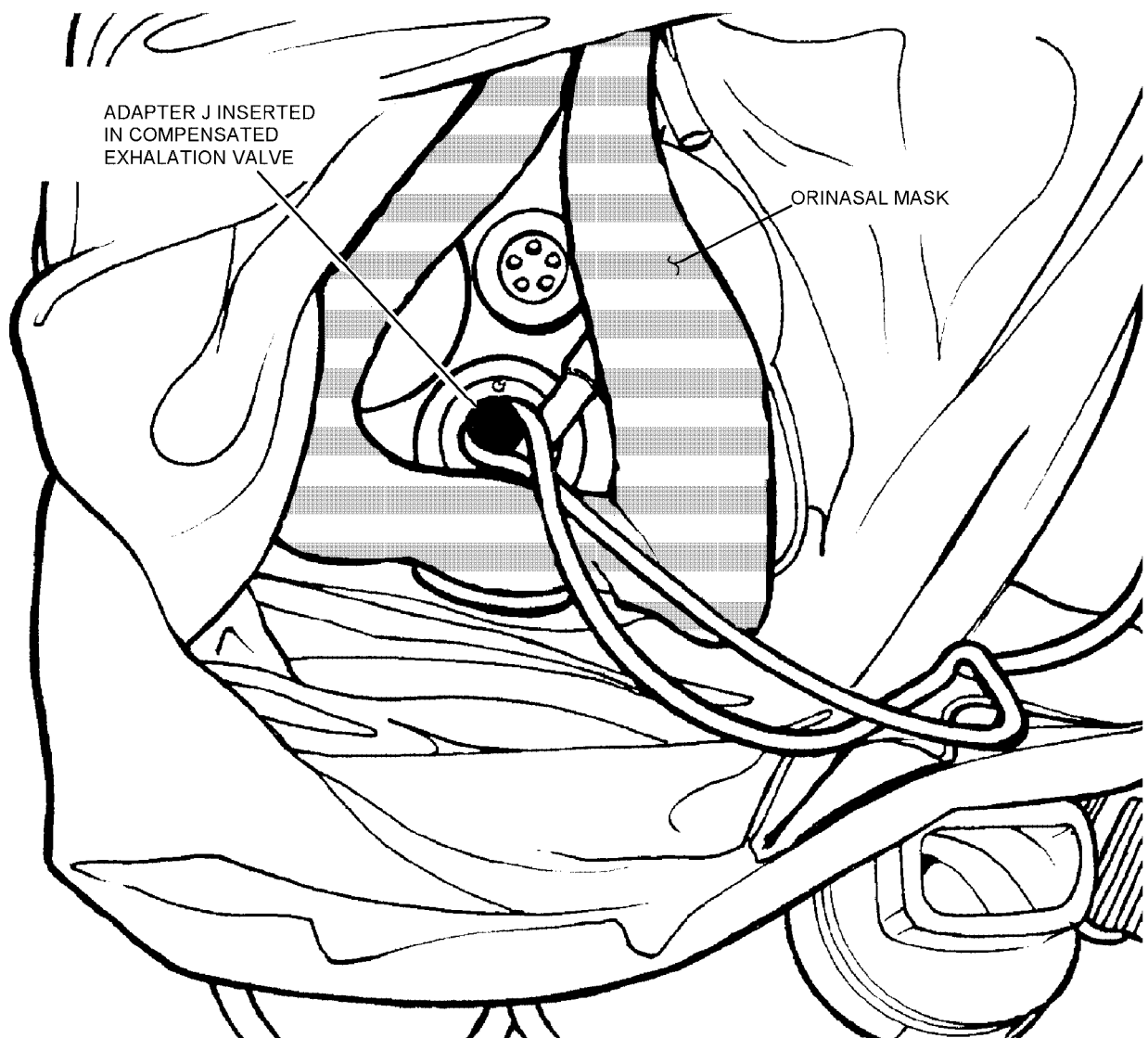


Figure 4-81. Inverted Hood

4-81

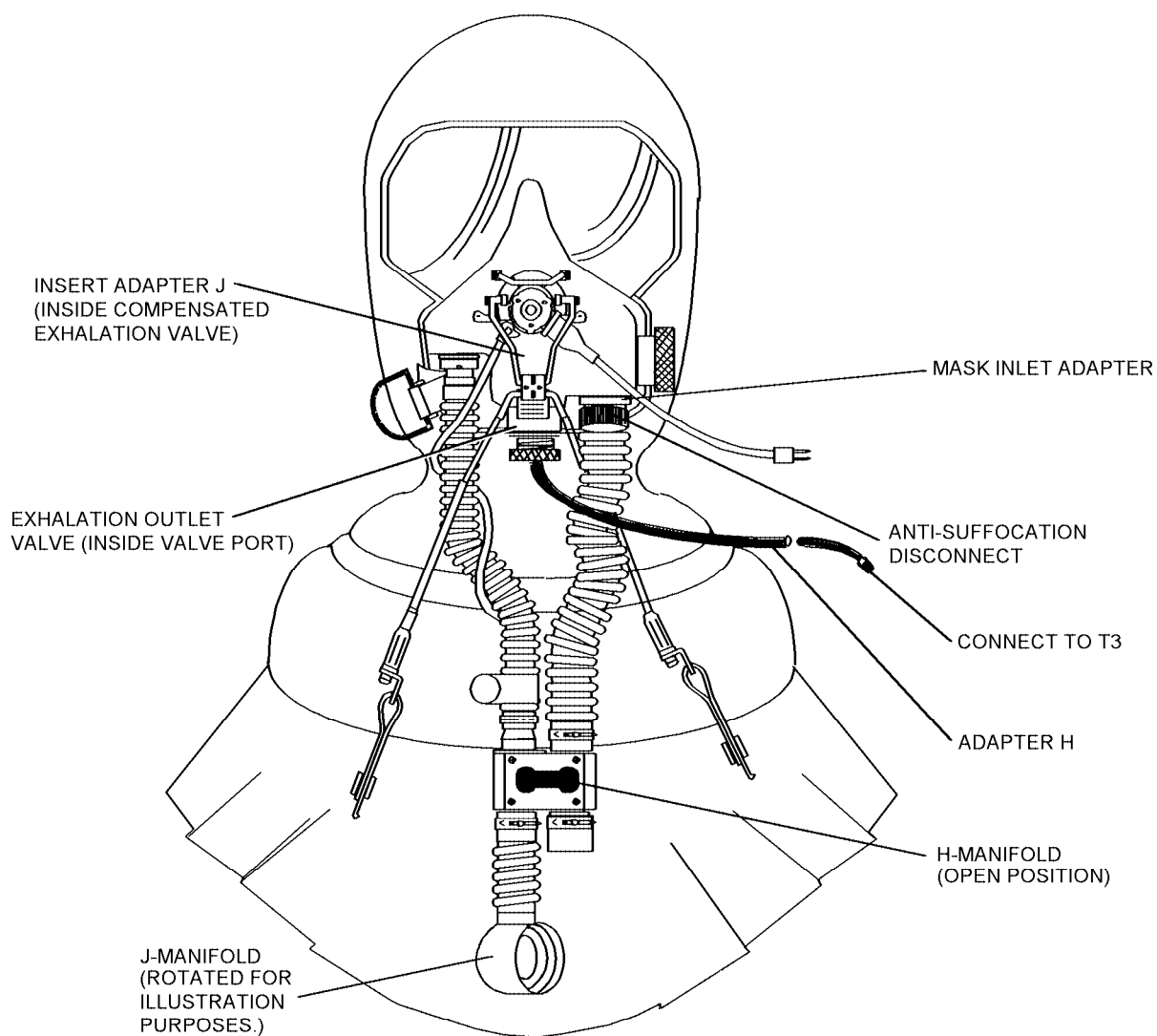


Figure 4-82. (V)1 Variant - Non-Oxygen Exhalation Outlet Valve - Reverse Leakage Test

4-82

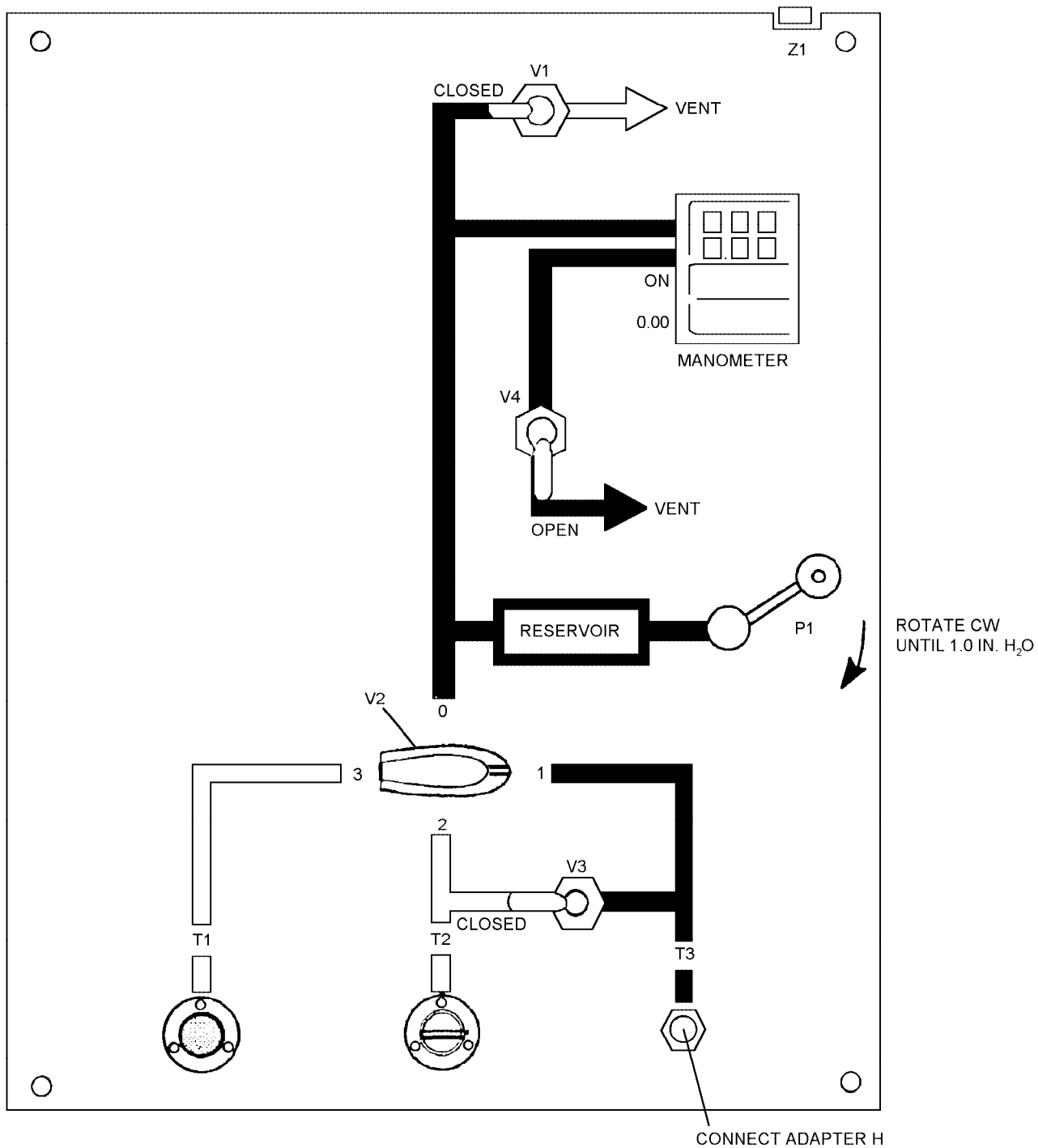


Figure 4-83. Exhalation Outlet Valve - Reverse Leakage Test

4-148. Compensated Exhalation Valve - Functional Test.

1. Ensure brass shear screw is removed from anti-suffocation disconnect.
2. Separate anti-suffocation disconnect from mask inlet adapter.
3. Connect adapter E between the anti-suffocation disconnect and mask inlet adapter (figure 4-84).
4. Connect adapter G to T3 and the neck seal test stand (figure 4-85).

WARNING

Be careful not to rip the neck seal when fitting to neck seal test stand.

5. Fit the respirator neck seal to the neck seal test stand and secure with O-ring (figure 4-86).
6. Close hood outlet valve.
7. Fit pusher fan to J-manifold (if not already connected).
8. Connect power supply (as performed during pusher fan pressure test) to the pusher fan.

NOTE

If a dc power supply is not available, a fully charged NiCad battery pack (P/N 3297AS601-1) may be used instead. If a NiCad battery pack is not available a Lithium battery pack (P/N 3297AS601-2) may be used.

9. Set V1 to CLOSED.
10. Set V2 to 1.
11. Ensure V3 is CLOSED.
12. Ensure V4 is OPEN.
13. Turn power supply ON and note pressure on digital manometer after hood is fully inflated. Ensure

external power supply is providing an output of 3.75 Vdc at 1 amp. Allow to stabilize for a period of 1 minute before taking a reading. The digital manometer shall read 2.6 in. H₂O or higher. Record result on Performance Test Sheet. If manometer does not read 2.6 in. H₂O or higher, refer to table 4-4, Respirator Assembly - Troubleshooting.

14. Disconnect adapter E (quick disconnect) into two halves. Ensure air vents from mask exhalation valve port.

15. Observe and note pressure shall not be more than 1.5 in. H₂O. Record result on Performance Test Sheet. If the pressure is more than 1.5 in. H₂O, refer to table 4-4, Respirator Assembly - Troubleshooting.

16. Re-connect adapter E (quick disconnect).

17. Repeat the test procedure from steps 14-16 three times.

18. Turn OFF power supply.

19. Open hood outlet valve.

20. Disconnect pusher fan from power supply.

21. Remove adapter E from mask inlet adapter and anti-suffocation disconnect.

22. Reconnect mask inlet adapter and anti-suffocation disconnect.

23. Reassemble adapter E.

4-149. Mask Assembly - Overall Leakage Test.

1. Ensure neck seal is properly fitted to neck seal test stand (figure 4-86).

1A. Remove Pusher Fan.

2. Fit blank B7 to J-manifold (figure 4-87).

3. Ensure adapter G is correctly fitted between T3 and neck seal test stand port (figure 4-88).

4. Close hood outlet valve.

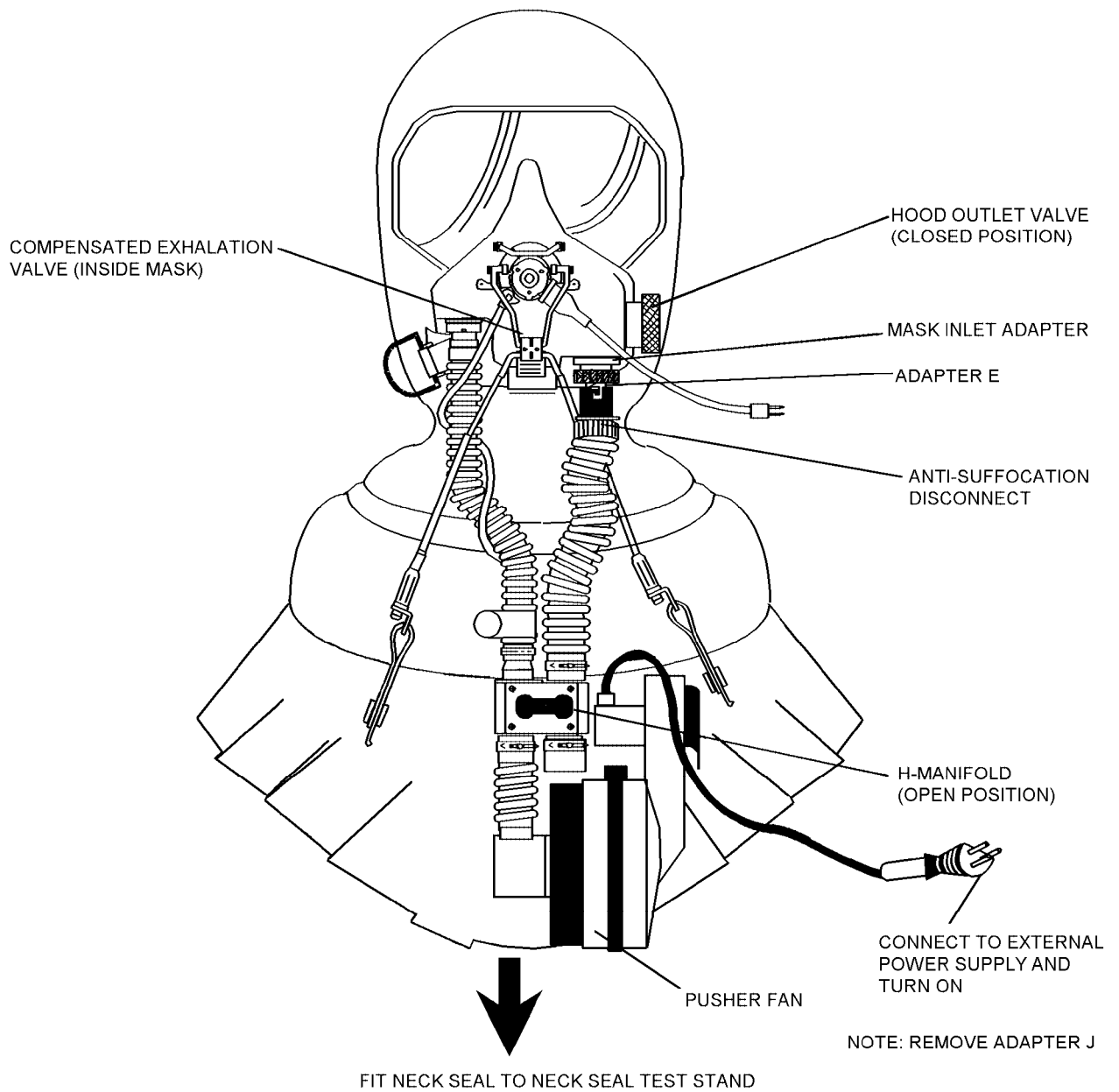


Figure 4-84. (V)1 Variant - Non-Oxygen Compensated Exhalation Valve - Functional Test

4-84

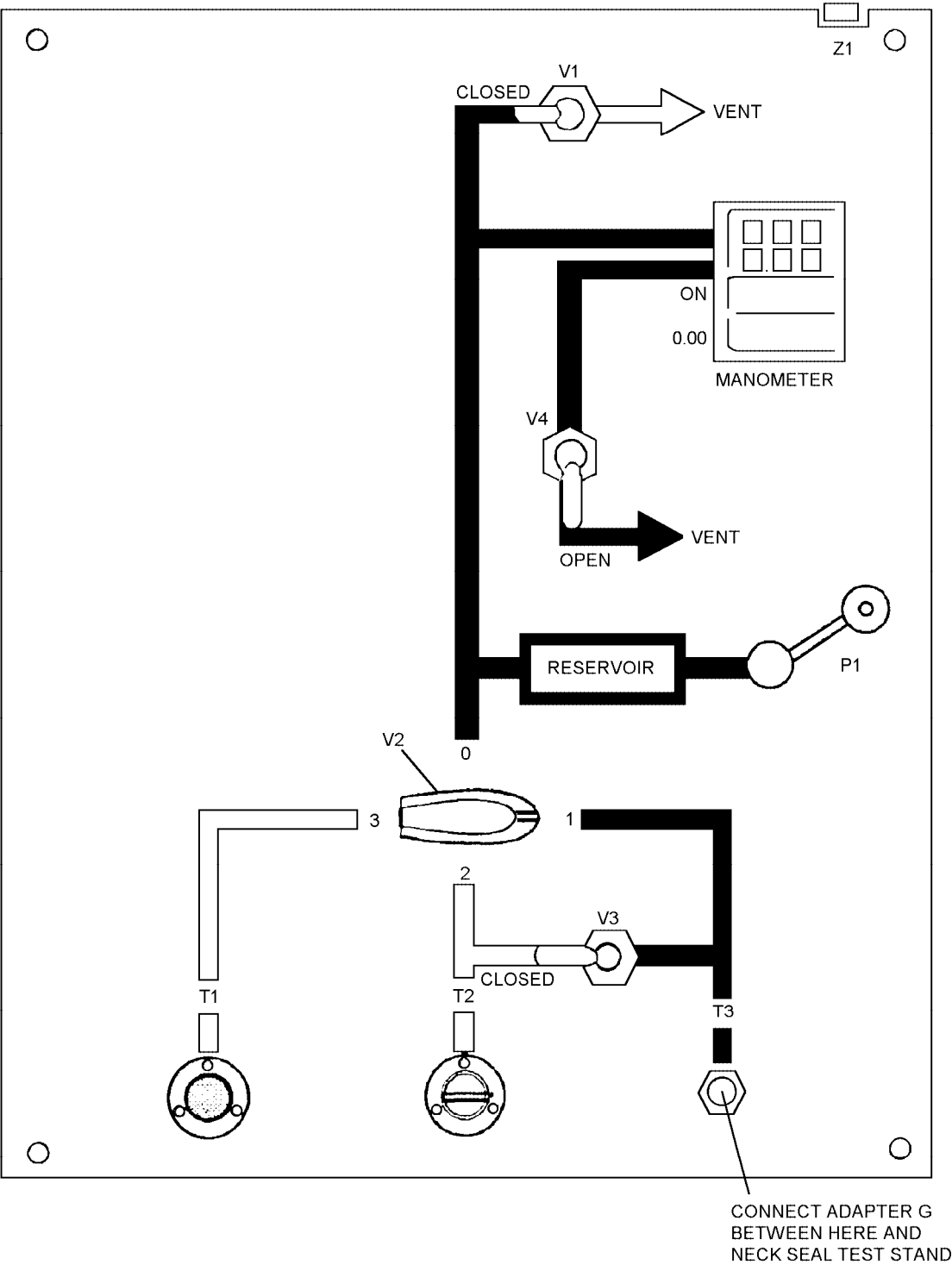


Figure 4-85. Compensated Exhalation Valve - Functional Test

4-85

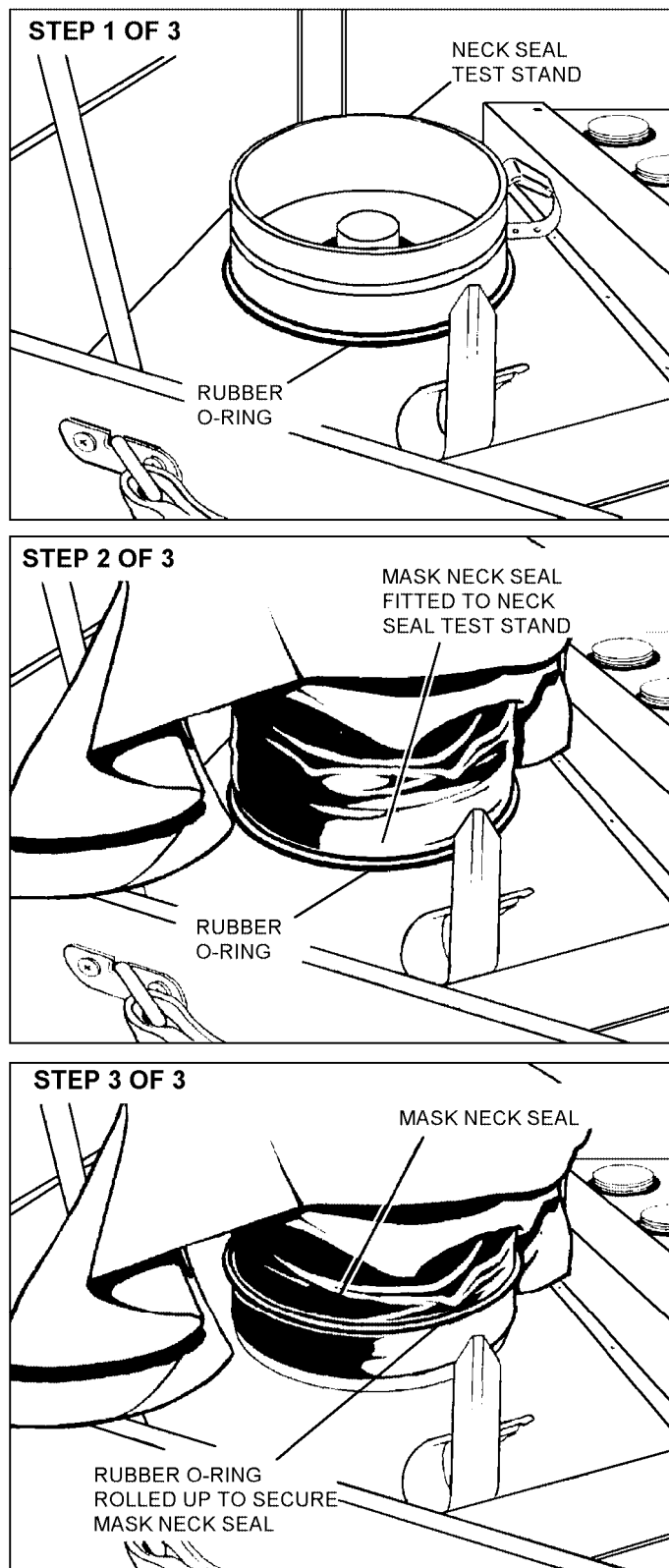


Figure 4-86. Neck Seal Test Stand

NOTE

Wetting O-ring on adapter H with water will make it easier to fit into exhalation valve port. Ensure O-ring does not roll out of its seat.

5. Slowly push adapter H into the exhalation valve port. Push straight-in until O-ring is no longer visible.

6. Fit blank B4 to free end of adapter H ([figure 4-87](#)).

7. Screw pusher fan into test adapter #2.

8. Connect free end of test adapter #2 to T2 ([figure 4-88](#)).

9. Set V1 to CLOSED.

10. Set V2 to 1.

11. Set V3 and V4 to OPEN.

12. Connect pusher fan to the power supply. Ensure power supply output is on and set to 3.75 Vdc at 1 amp.

13. Inflate hood until 2 in. H₂O is indicated on the digital manometer then set V3 to CLOSED.

14. Allow system to stabilize for a period of 1 minute. Switch V3 from OPEN to CLOSED to maintain 2 in. H₂O.

15. Set V3 to CLOSED and turn off power supply to pusher fan.

16. Observe and note the pressure on the digital manometer is between 2.0 and 1.95 in. H₂O after one minute. It may be necessary to exceed 2 in. H₂O and repeat several times until pressure stabilizes. Record result on Performance Test Sheet. If manometer does not read between 1.95 and 2.0 in. H₂O then refer to [table 4-4](#), Respirator Assembly - Troubleshooting.

17. Open hood outlet valve.

18. Set V1 to OPEN.

19. Disconnect pusher fan from external power supply.

20. Disconnect adapter #2 from T2.

21. Remove adapter #2 from pusher fan.

22. Remove respirator from neck seal test stand.

23. Remove adapter G from T3 and neck seal test stand.

24. Remove adapter H and blank B4.

25. Refit snout and secure with a 3.6 mm wide, black cable tie. Tension with a cable tie tool set to INT, 4 (Intermediate) setting. Position cable tie head to wearer's right side.

26. Remove blank B7 from J-manifold.

27. Refit pusher fan assembly to J-manifold.

28. Refit shear screw to anti-suffocation disconnect.

29. Complete Performance Test Sheet.

NOTE

The following test should only be performed to help isolate a leak in mask.

4-150. Hood Assembly - Overall Leakage Test.

1. Remove shear screw and retain. Detach hood inlet and mask inlet hoses from mask in accordance with disassembly, [paragraph 4-159](#).

2. Remove cable tie securing snout to faceplate. Remove snout.

3. Connect adapter H to the mask exhalation outlet valve port.

4. Fit blank B4 to free end of adapter H.

5. Support mask on hanger by its toggle harness.

6. Fit hood assembly to neck seal test stand and adjust neck seal to lie without creasing the sealing ring.

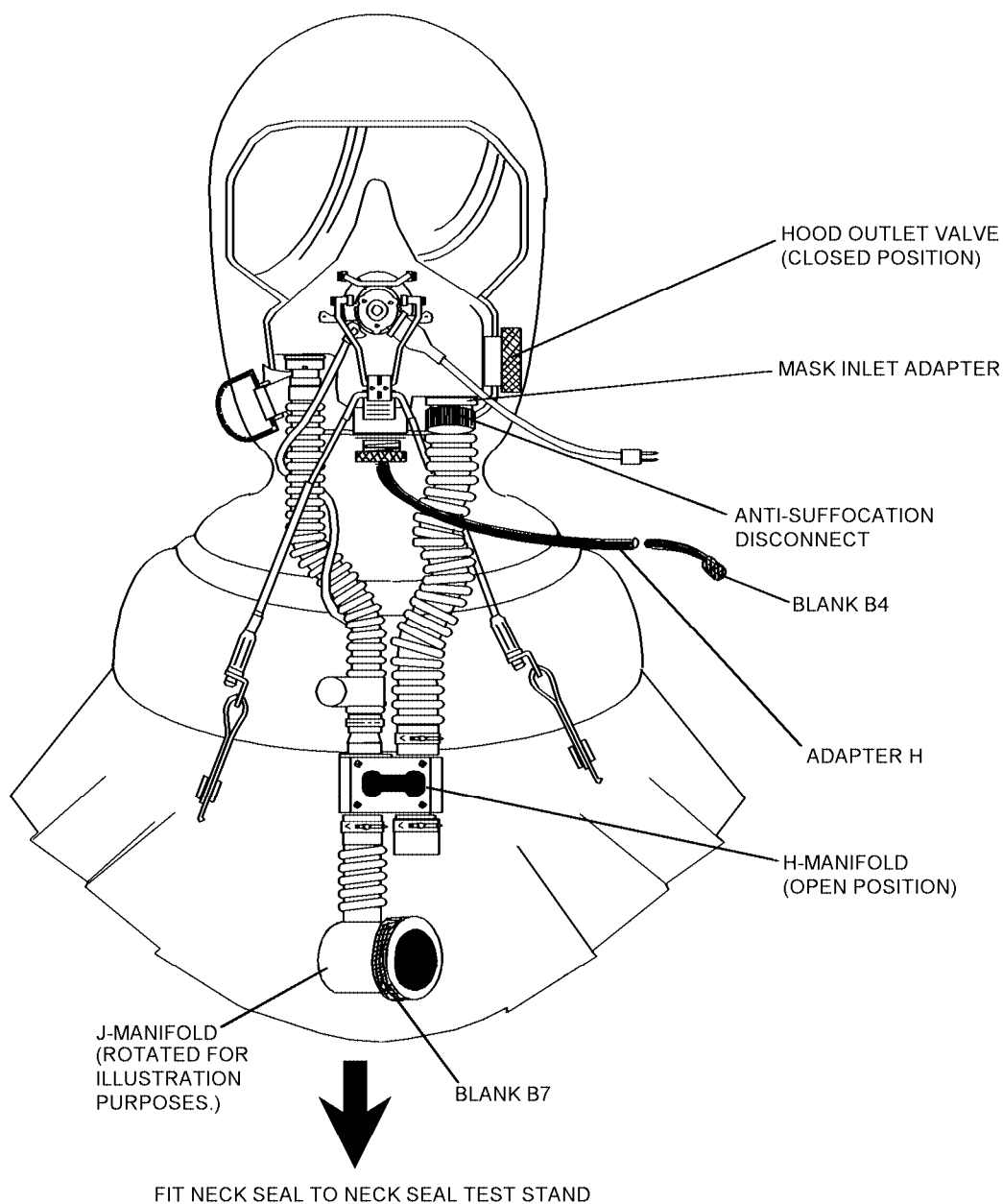


Figure 4-87. (V)1 Variant - Non-Oxygen Mask Assembly - Overall Leakage Test

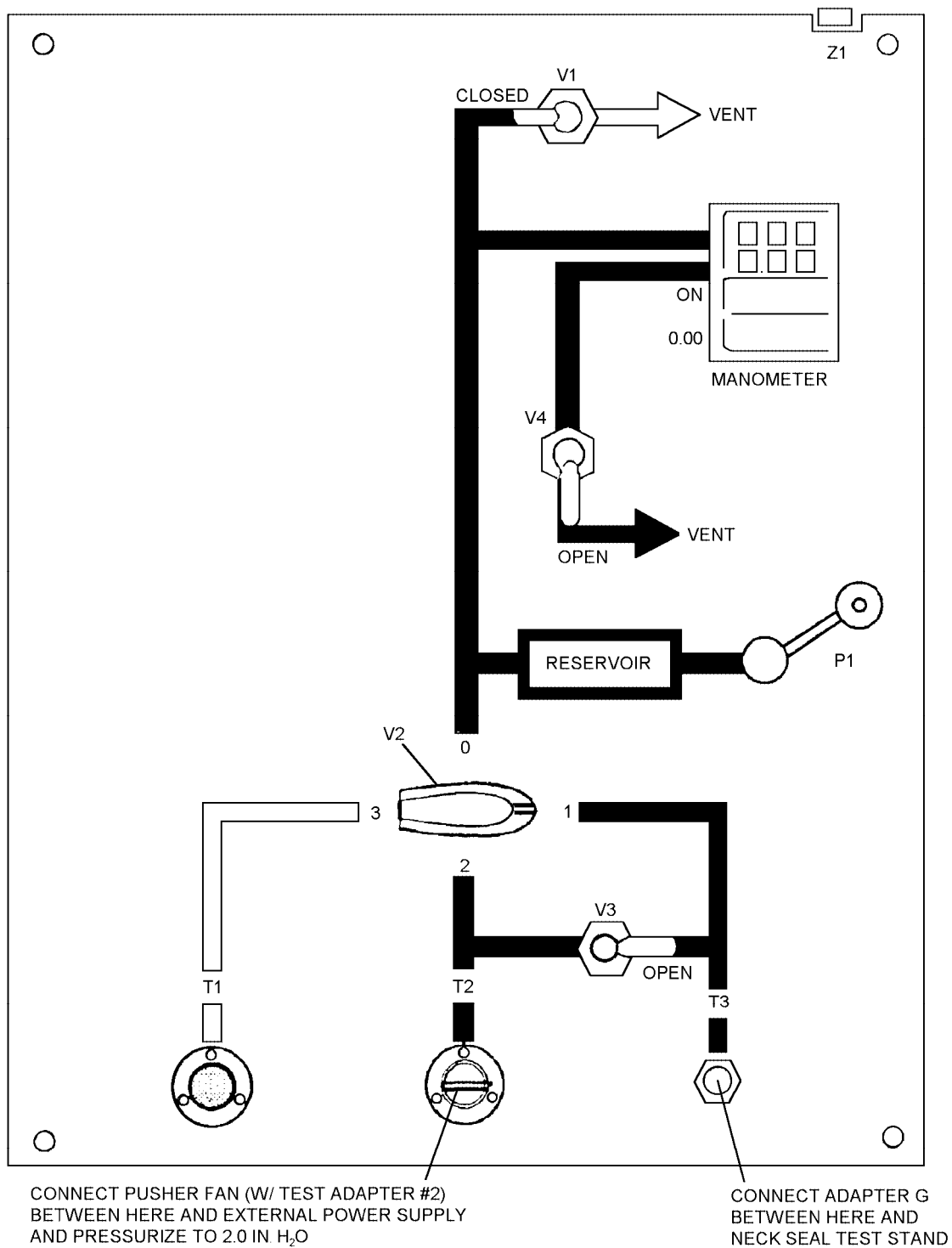


Figure 4-88. Mask Assembly - Overall Leakage Test

7. Close hood outlet valve.
8. Connect one end of Adapter G to T3 and other end to neck seal test stand port.
9. Fit blank B5 to mask inlet adapter (figure 4-89).
10. Fit blank B6 to hood inlet adapter (figure 4-89).
11. Remove the pusher fan from J-manifold.
12. Screw pusher fan canister into J-manifold of test adapter #2.
13. Connect test adapter #2 to T2 (figure 4-90).
14. Connect power supply to the pusher fan and turn on. Ensure power supply is set to 3.75 Vdc at 1 amp.
15. Set V2 to 1 and V3 to the OPEN position. Inflate the hood until 2 in. H₂O is indicated on digital manometer.
16. Set V1 to CLOSED position. Set V4 to OPEN. Allow pressure within hood to stabilize, if necessary, by adjusting V1 (opening and closing) to maintain 2 in. H₂O.
17. When stabilized, set V1 to Closed. In the event reading is too high, reduce pressure by opening hood outlet valve. Set power supply switch to OFF.
18. Observe pressure indicated on digital manometer. Pressure shall be between 1.95 and 2.0 in. H₂O during a one minute period. If manometer fails to indicate or if pressure is not between 1.95 and 2.0 in. H₂O refer to table 4-4, Respirator Assembly - Troubleshooting. Record results on Performance Test Sheet.
19. Set V1 to OPEN.
20. Open the hood outlet valve.
21. Disconnect test adapter #2 from T2 and disconnect from the external power supply.

22. Remove the pusher fan from test adapter #2.
23. Replace pusher fan to J-manifold.
24. Remove adapter G.
25. Remove blanks B4, B5, and B6.
26. Remove mask from the neck seal stand and support hanger, and fit velveteen cover.
27. Remove adapter H from exhalation valve port.
28. Refit restraint cords/pins and snout, hood and mask inlet hoses in accordance with paragraph 4-223, Assembly.
29. Peel away protective coating (if applied to faceplate area prior to bench testing). Ensure no traces remain on visual area.

4-151. A/P22P-14(V)2 through (V)4 Respirator Assemblies Only.

NOTE

Left-side or right-side pertains to the side when wearing mask.

4-152. Inhalation and Hood Inlet Valves - Reverse Leakage Test.

1. Ensure H-manifold selector knob is set to OPEN (horizontal position).
2. Unscrew pusher fan from right-side J-manifold (do not remove cable tie).
3. Remove 90° rubber molding/filter canister from left-side J-manifold.
4. Support mask on test set hanger (figure 4-76) by toggle harness.
5. Remove and retain brass shear screw from anti-suffocation disconnect.
6. Twist off anti-suffocation disconnect from mask inlet adapter.

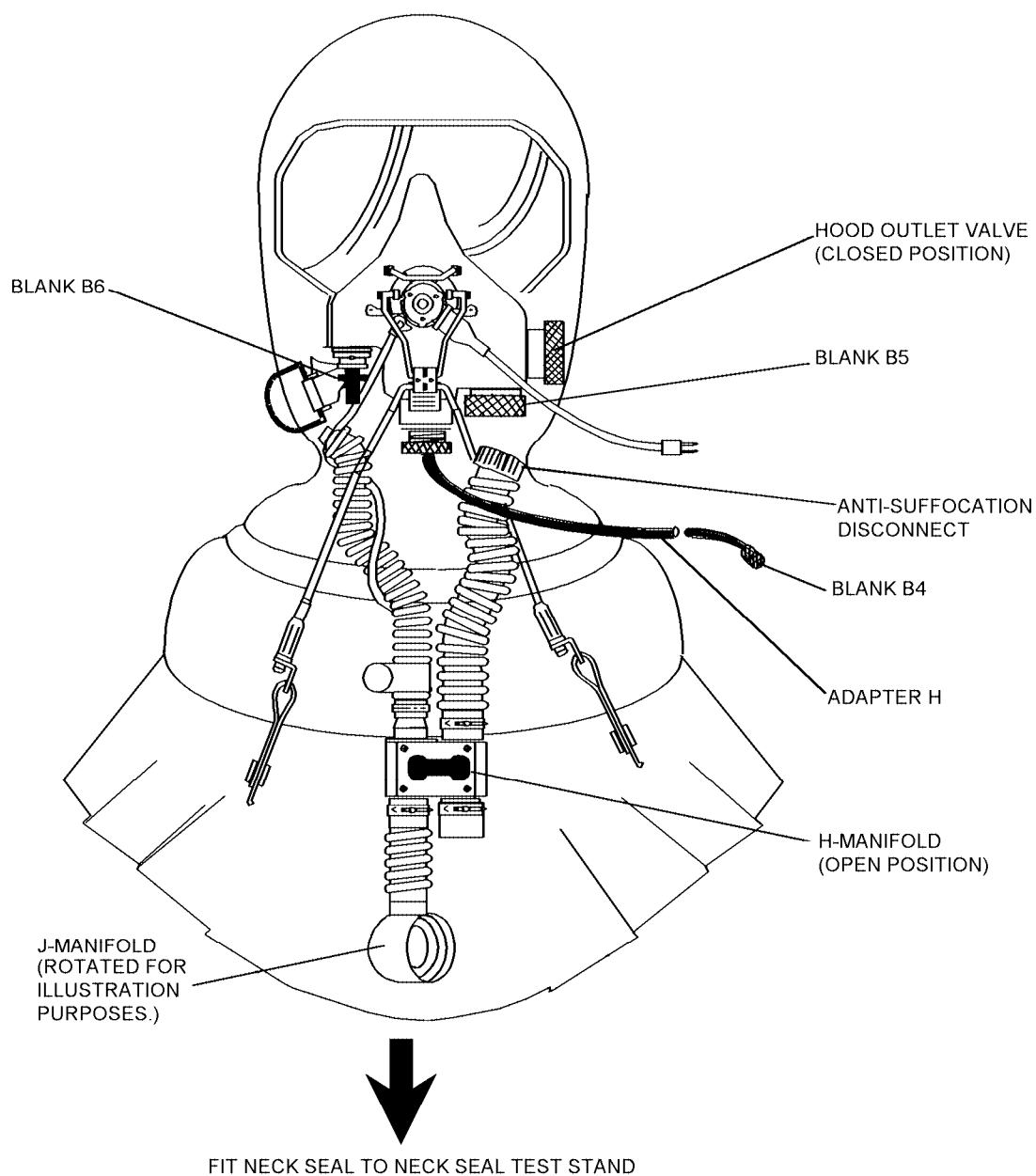


Figure 4-89. (V)1 Variant - Non-Oxygen Hood Assembly - Overall Leakage Test

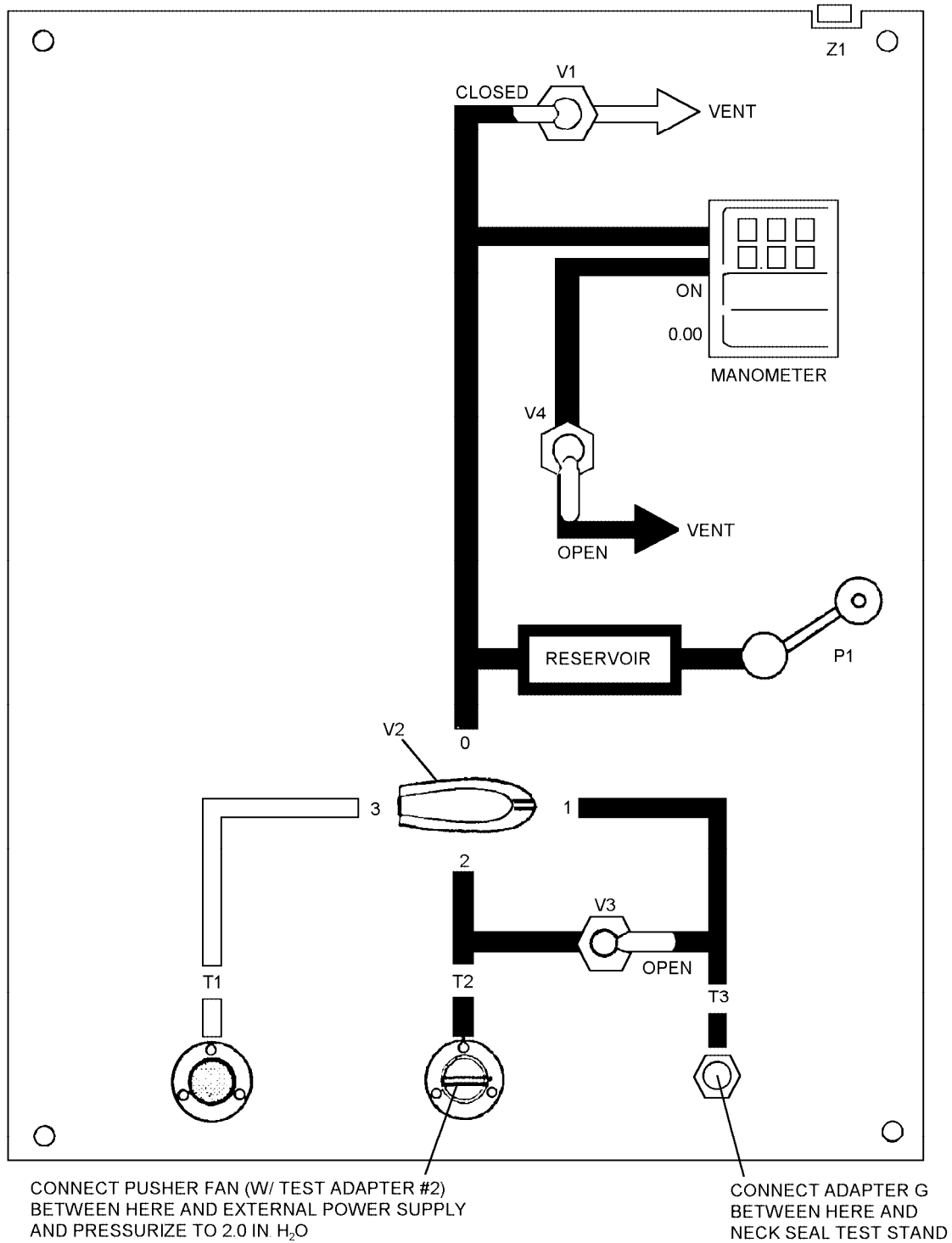


Figure 4-90. Hood Assembly - Overall Leakage Test

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7. Connect adapter M between mask inlet adapter and anti-suffocation disconnect (figure 4-91).

8. Connect free end of adapter M to T1 (figure 4-92).

9. Fit blanks B7 to both J-manifolds.

10. Set V1 and V3 to CLOSED.

11. Set V2 to 3.

12. Ensure V4 is OPEN.

WARNING

Overpressurization will collapse stepped rubber valve into valve seat.

13. Slowly rotate pump handle (P1) counter-clockwise until digital manometer reads -4 in. H₂O. Once the digital manometer reads -4 in. H₂O, observe and note the suction reading on digital manometer during a period of 7 seconds. Do not allow pressure to exceed -4.25 in. H₂O. Reading shall be between -2 and -4 in. H₂O. Record results on Performance Test Sheet.

NOTE

If digital manometer does not hold a steady pressure or read between -2 and -4 in. H₂O, refer to the table 4-4 for troubleshooting procedures.

14. Set V1 to OPEN.

15. Remove adapter M from T1.

16. Remove adapter M from anti-suffocation disconnect and mask inlet adapter.

17. Remove both B7 blanks from J-manifolds.

4-153. H-manifold Inlet Valve - Reverse Leakage Test.

1. Ensure H-manifold selector knob is set to the OPEN (horizontal) position.

2. Connect adapter K to right-side J-manifold and T2 (figure 4-93 and 4-94).

3. Set V1 to CLOSED.

4. Set V2 to 2.

5. Set V3 to CLOSED.

6. Ensure V4 is OPEN.

7. Rotate pump handle (P1) counter-clockwise until digital manometer reads -4 in. H₂O. Observe and note pressure reading on digital manometer during a period of 7 seconds. Do not allow pressure to exceed -4.25 in. H₂O. Reading shall be between -2 and -4 in. H₂O. Record results on Performance Test Sheet.

NOTE

If digital manometer does not read between -2 and -4 in. H₂O, refer to table 4-4 for troubleshooting procedures.

8. Set V1 to OPEN.

9. Remove adapter K from T2 and right-side J-manifold.

10. Reconnect anti-suffocation disconnect to mask inlet adapter.

4-154. Exhalation Outlet Valve - Reverse Leakage Test.

1. Remove and discard cable tie from rubber snout.

2. Remove snout.

3. Prop open compensated exhalation valve (inside orinasal mask) using adapter J (rubber stopper) (figure 4-81).

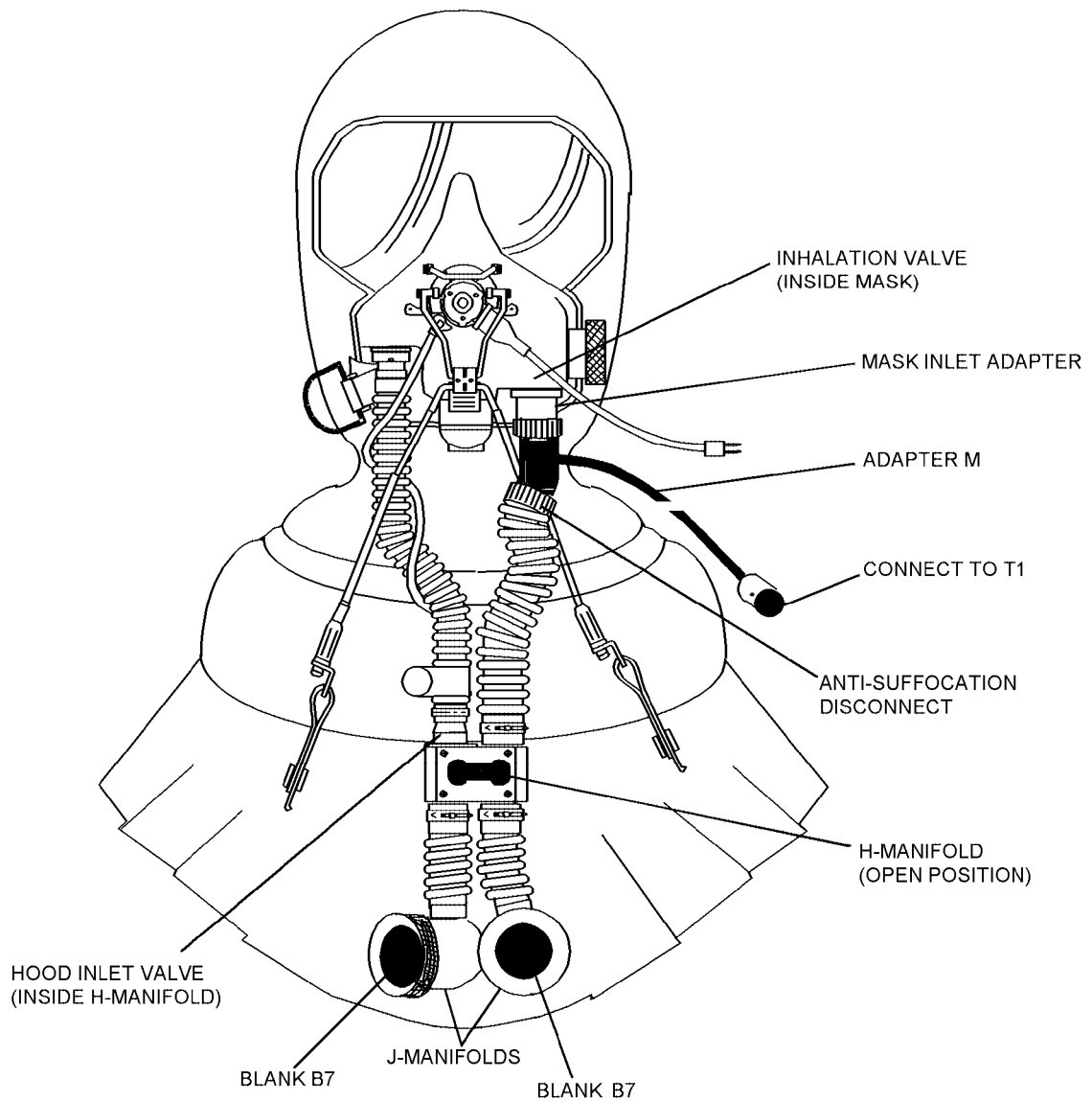


Figure 4-91. (V)2 thru (V)4 Variants Inhalation and Hood Inlet Valves - Reverse Leakage Test

4-91

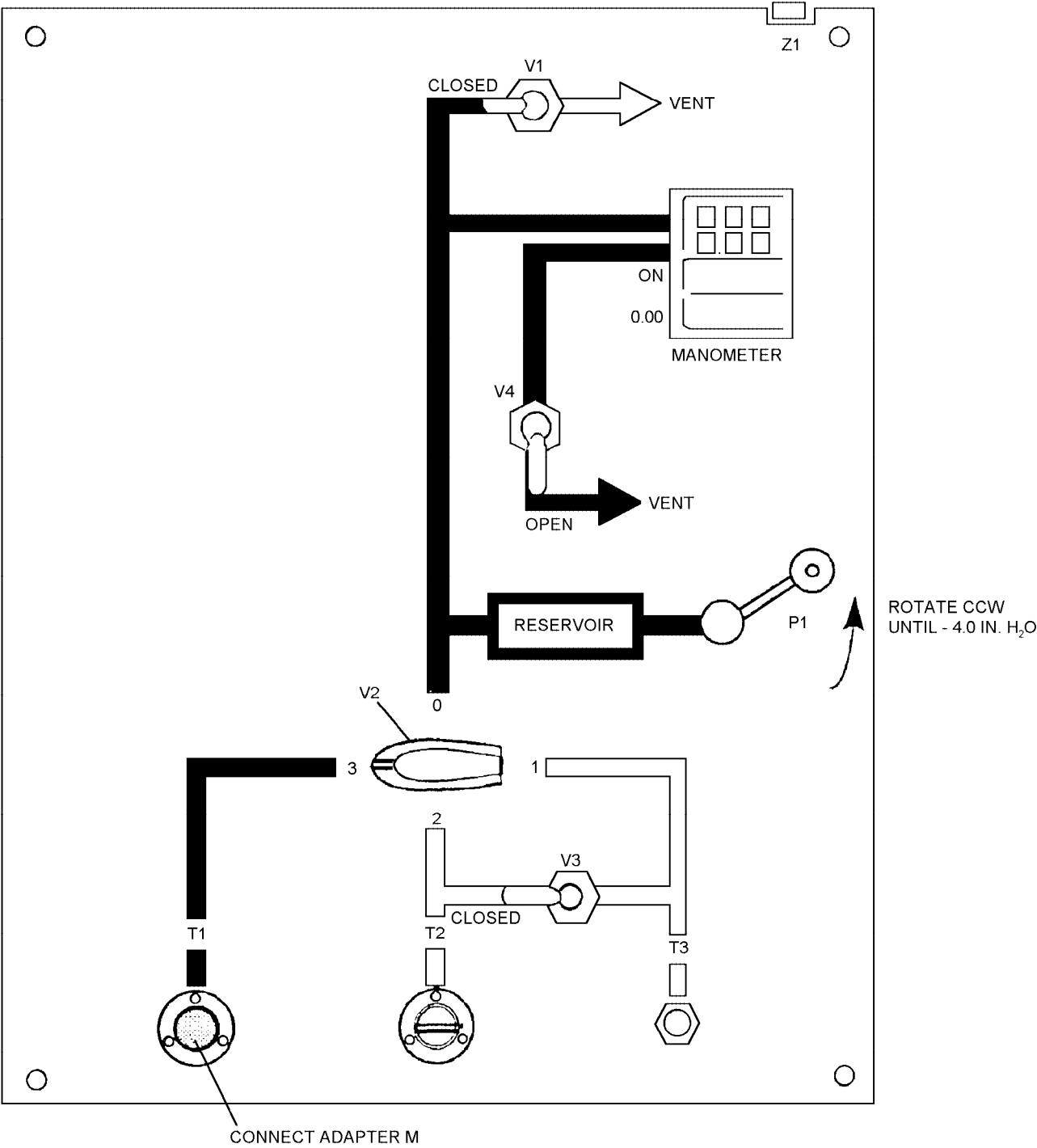


Figure 4-92. Inhalation and Hood Inlet Valves - Reverse Leakage Test

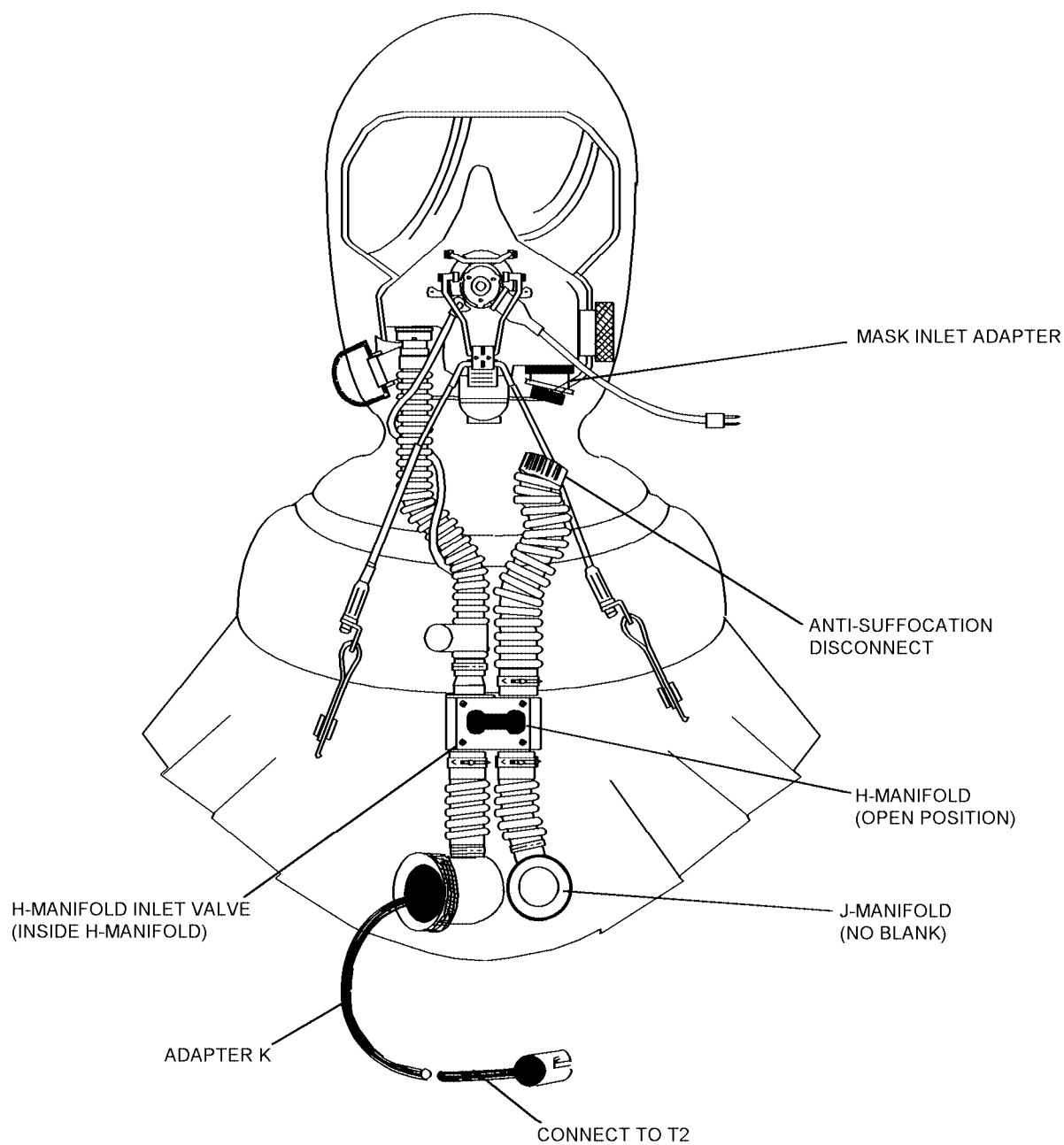


Figure 4-93. (V)2 thru (V)4 Variants - H-Manifold Inlet Valve - Reverse Leakage Test

4-93

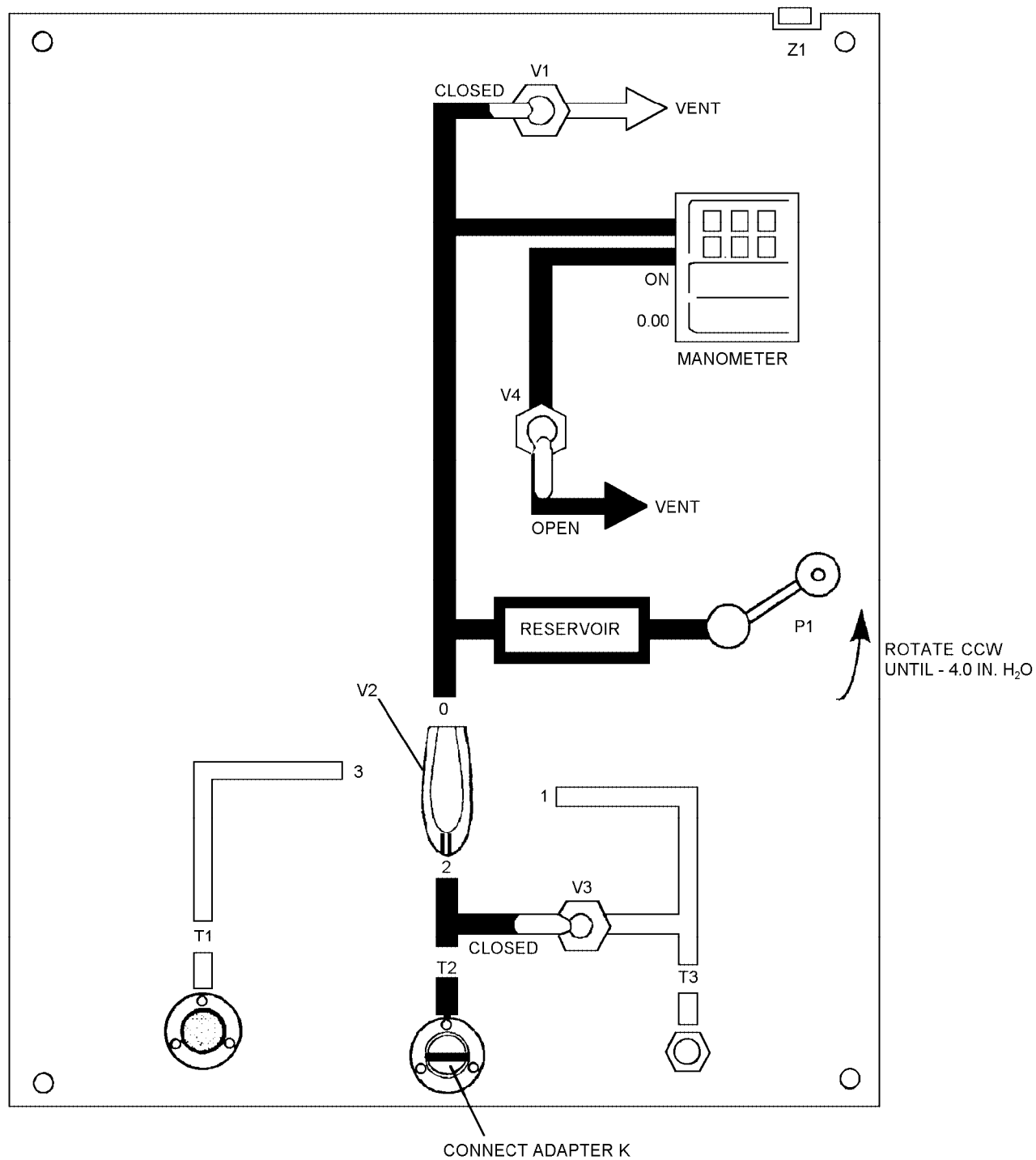


Figure 4-94. H-Manifold Inlet Valve - Reverse Leakage Test

NOTE

Wetting the O-ring on adapter H will make it easier to fit the exhalation valve port. Ensure O-ring does not roll out of its seat.

4. Slowly push adapter H into exhalation valve port. Push straight-in until O-ring is no longer visible (figure 4-95).

5. Connect free end of adapter H to T3 (figure 4-96).

6. Set V1 to CLOSED.

7. Set V2 to 1.

8. Set V3 to CLOSED.

9. Set V4 to OPEN.

10. Don't rotate pump handle too fast. Rotate pump handle (P1) clockwise until digital manometer reads 1 in. H₂O. Once digital manometer reaches 1 in. H₂O, observe and note the pressure reading during a 12 second period. Digital manometer reading shall be between 0.5 and 1.0 in. H₂O. Record results on Performance Test Sheet.

NOTE

If digital manometer does not read between 0.5 and 1.0 in. H₂O, refer to table 4-4 for troubleshooting procedures.

11. Set V1 to OPEN.

12. Remove adapter H from T3 and exhalation valve port.

13. Remove adapter J from the compensated exhalation valve.

4-155. Compensated Exhalation Valve - Functional Test.

1. Ensure H-manifold is set to OPEN (horizontal) position.

2. Ensure brass shear screw is removed from anti-suffocation disconnect.

3. Separate anti-suffocation disconnect from mask inlet adapter.

4. Connect adapter E between the anti-suffocation disconnect and the mask inlet adapter (figure 4-97).

5. Connect adapter G to T3 and neck seal test stand (figure 4-98).

6. Fit respirator neck seal to neck seal test stand (figure 4-76).

7. Close hood outlet valve.

8. Fit pusher fan to right-side J-manifold (if not already connected).

9. Connect power supply (as performed during Pusher Fan Pressure Test) to pusher fan.

10. Blank B7 to left-side J-manifold.

NOTE

If a dc power supply is not available, a fully charged NiCad battery pack shall be used. If a NiCad battery is not available a Lithium battery pack (P/N 3297AS601-2) may be used instead.

11. Set V1 to CLOSED.

12. Set V2 to 1.

13. Ensure V3 is CLOSED.

14. Ensure V4 is OPEN.

15. Turn power supply on and note pressure on digital manometer after hood is fully inflated. Ensure power supply is providing an output of 1A and 3.75 Vdc. Digital manometer shall read 2.6 in. H₂O or higher. Record result on Performance Test Sheet.

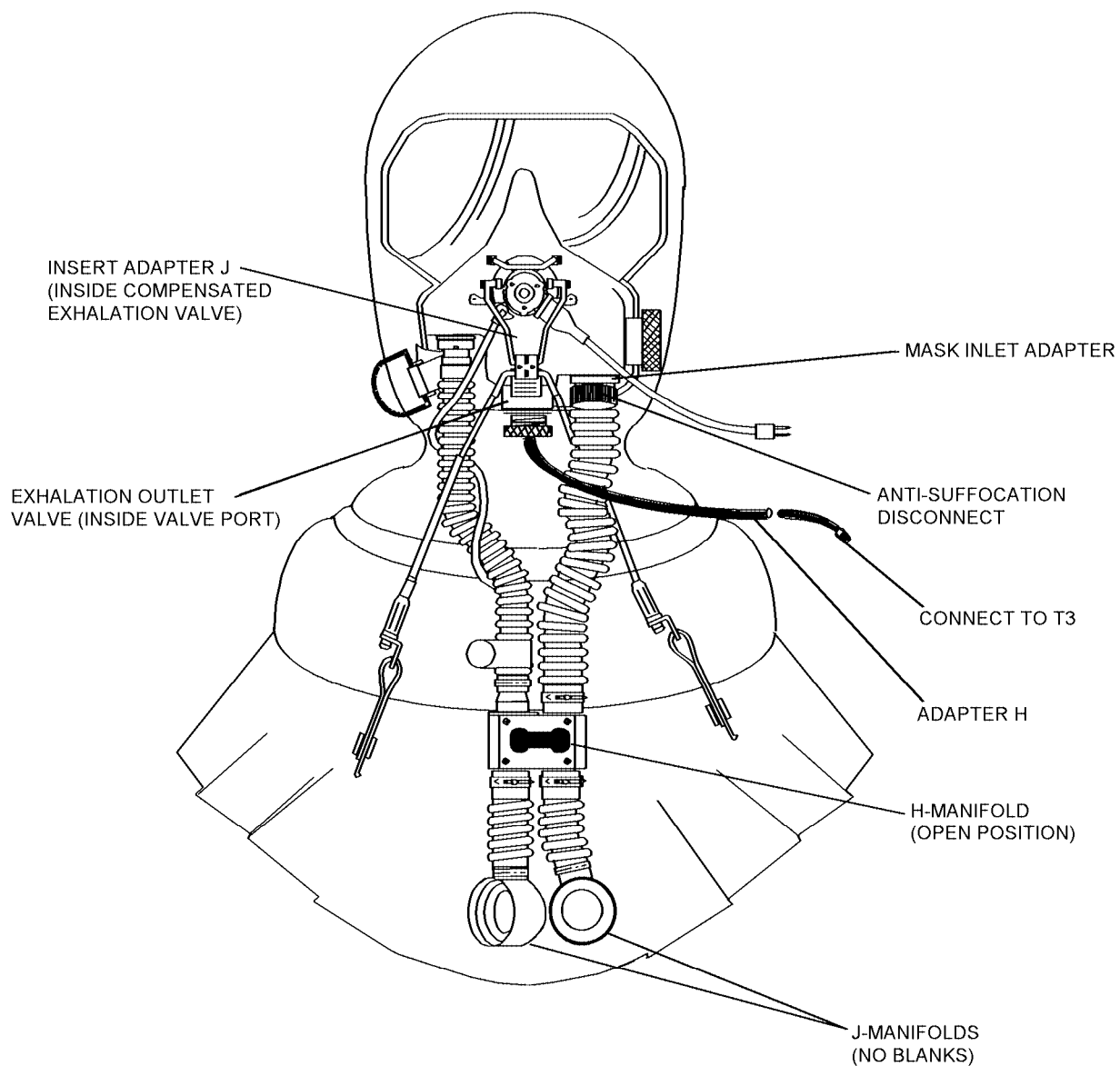


Figure 4-95. (V)2 thru (V)4 Variants - Exhalation Outlet Valve - Reverse Leakage Test

4-95

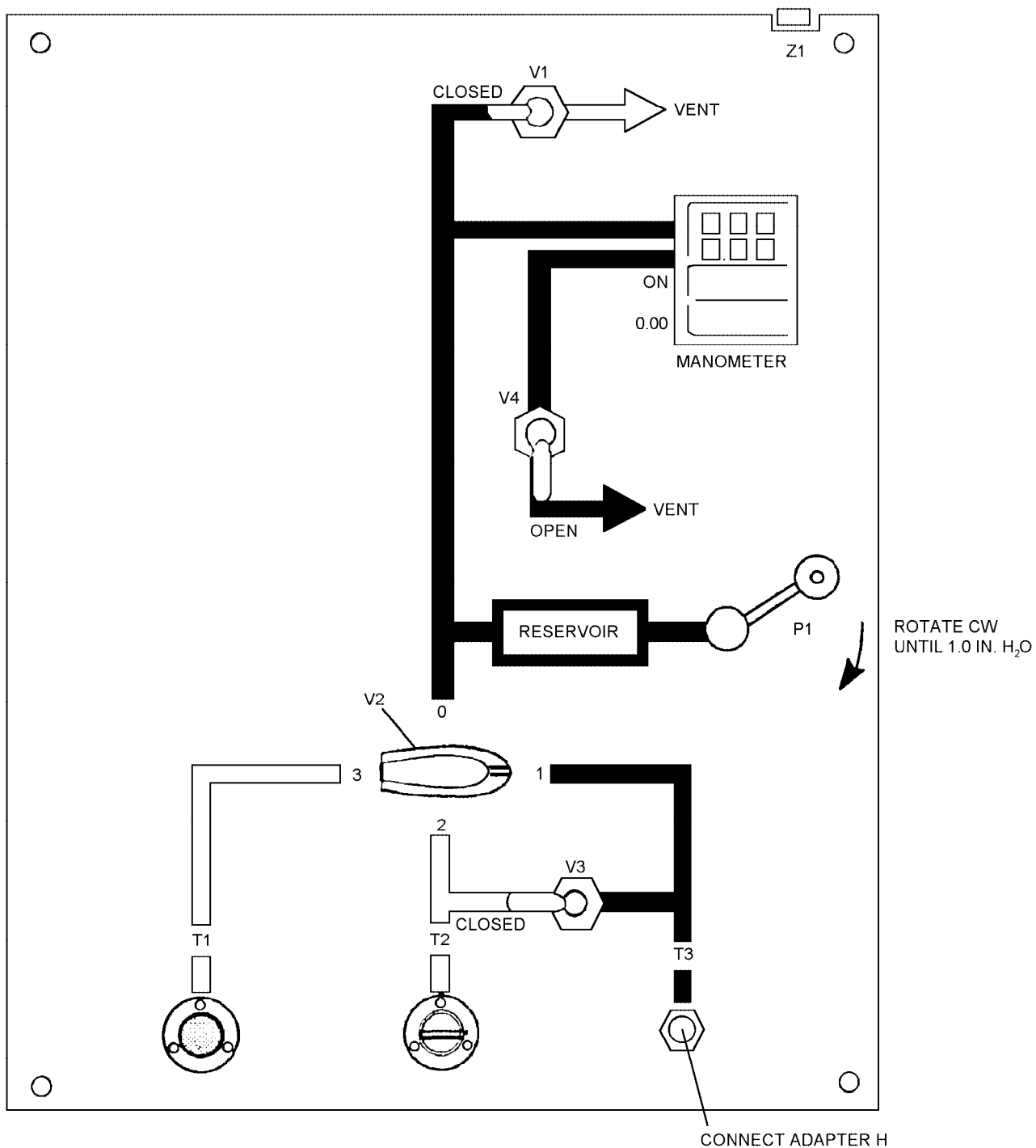


Figure 4-96. Exhalation Outlet Valve - Reverse Leakage Test

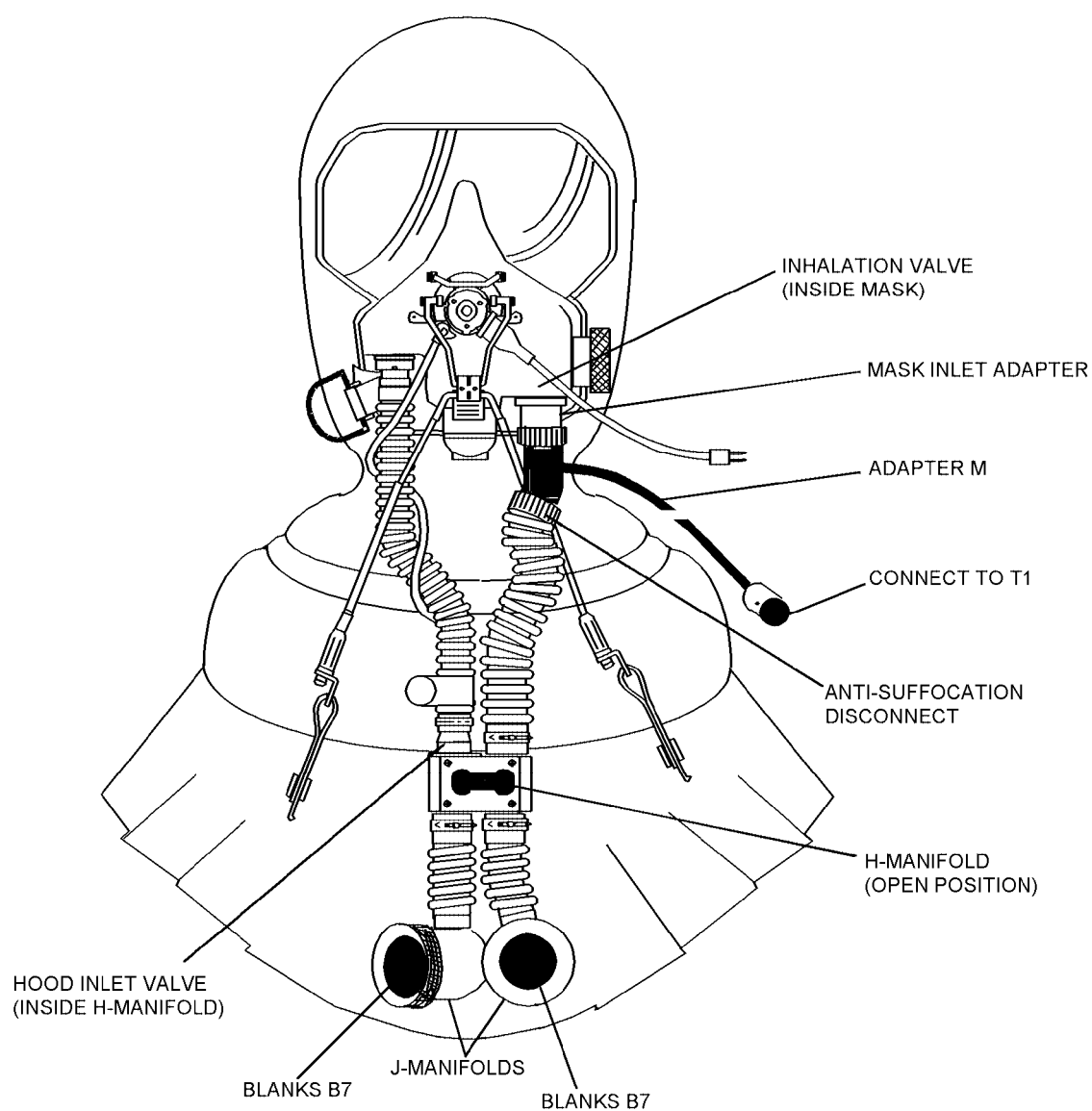


Figure 4-97. (V)2 thru (V)4 Variants - Compensated Exhalation Valve - Functional Test

4-97

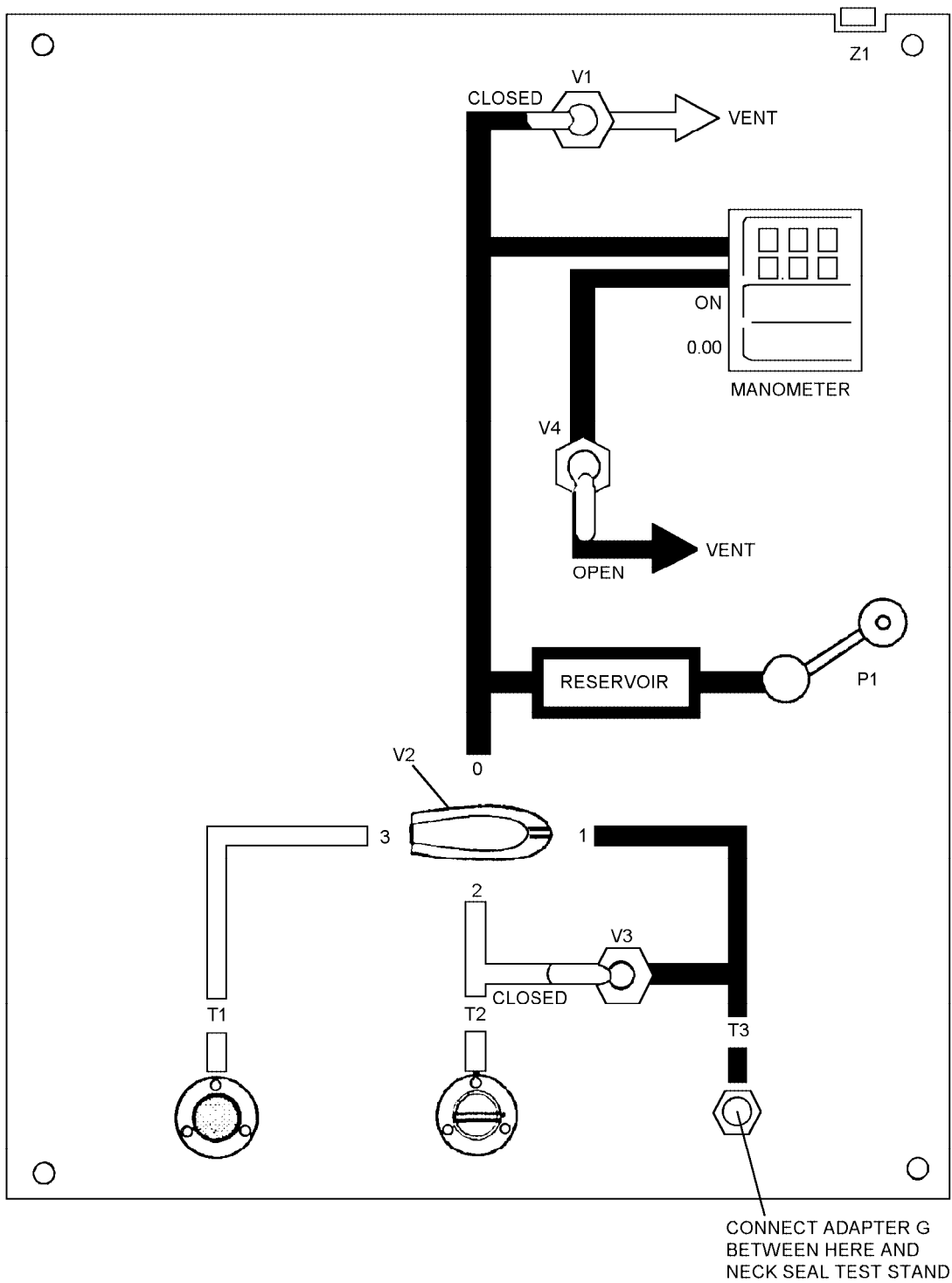


Figure 4-98. Compensated Exhalation Valve - Functional Test

NOTE

If digital manometer does not read 2.6 in. H₂O or higher, refer to [table 4-4](#) for troubleshooting procedures.

16. Disconnect adapter (quick disconnect) E into two halves. Ensure air vents from mask exhalation valve port.

NOTE

If air does not vent from exhalation valve port, refer to [table 4-4](#) for troubleshooting procedures.

17. Record result on Performance Test Sheet.

18. Observe and note pressure. Pressure shall not be more than 1.5 in. H₂O. Record result on the Performance Test Sheet.

19. Re-connect adapter E (quick disconnect).

20. Repeat test procedure from [steps 16 - 19](#) three times.

NOTE

If digital manometer reads more than 1.5 in. H₂O, refer to [table 4-4](#) for troubleshooting procedures.

21. Turn OFF power supply.

22. Open hood outlet valve.

23. Disconnect pusher fan from power supply.

24. Remove adapter E from mask inlet adapter and anti-suffocation disconnect.

25. Reassemble adapter E.

26. Reconnect mask inlet adapter and anti-suffocation disconnect.

27. Refit shear screw to anti-suffocation disconnect.

28. Remove pusher fan from right-side J-manifold.

4-156. Mask Assembly - Overall Leakage Test.

1. Ensure neck seal is properly fitted to neck seal test stand.

2. Fit blank B7 to right-side J-manifold ([figure 4-99](#)).

3. Ensure adapter G is correctly fitted between T3 and neck seal test stand port ([figure 4-100](#)).

4. Close hood outlet valve.

NOTE

Wetting O-ring on adapter H will make it easier to fit in exhalation valve port. Ensure O-ring does not roll out of its seat.

5. Slowly push adapter H into exhalation valve port. Push straight in until O-ring is no longer visible.

6. Fit blank B4 to free end of adapter H.

7. Screw pusher fan into test adapter #2.

8. Connect free end of test adapter #2 to T2.

9. Set V1 to CLOSED.

10. Set V2 to 1.

11. Set V3 and V4 to OPEN.

12. Connect power supply and switch to ON. Ensure power supply output is 1A and 3.75 Vdc.

NOTE

Ensure H-manifold is in OPEN position.

13. Inflate hood until 2 in. H₂O is indicated on digital manometer, then set V3 to CLOSED.

14. Allow system to stabilize. Switch V3 from OPEN to CLOSED to maintain 2 in. H₂O.

15. Set V3 to CLOSED and turn off power supply to pusher fan.

16. Observe and note pressure on digital manometer is between 2.0 and 1.95 in. H₂O after one minute. It may be necessary to repeat several times until pressure stabilizes. Record result on Performance Test Sheet.

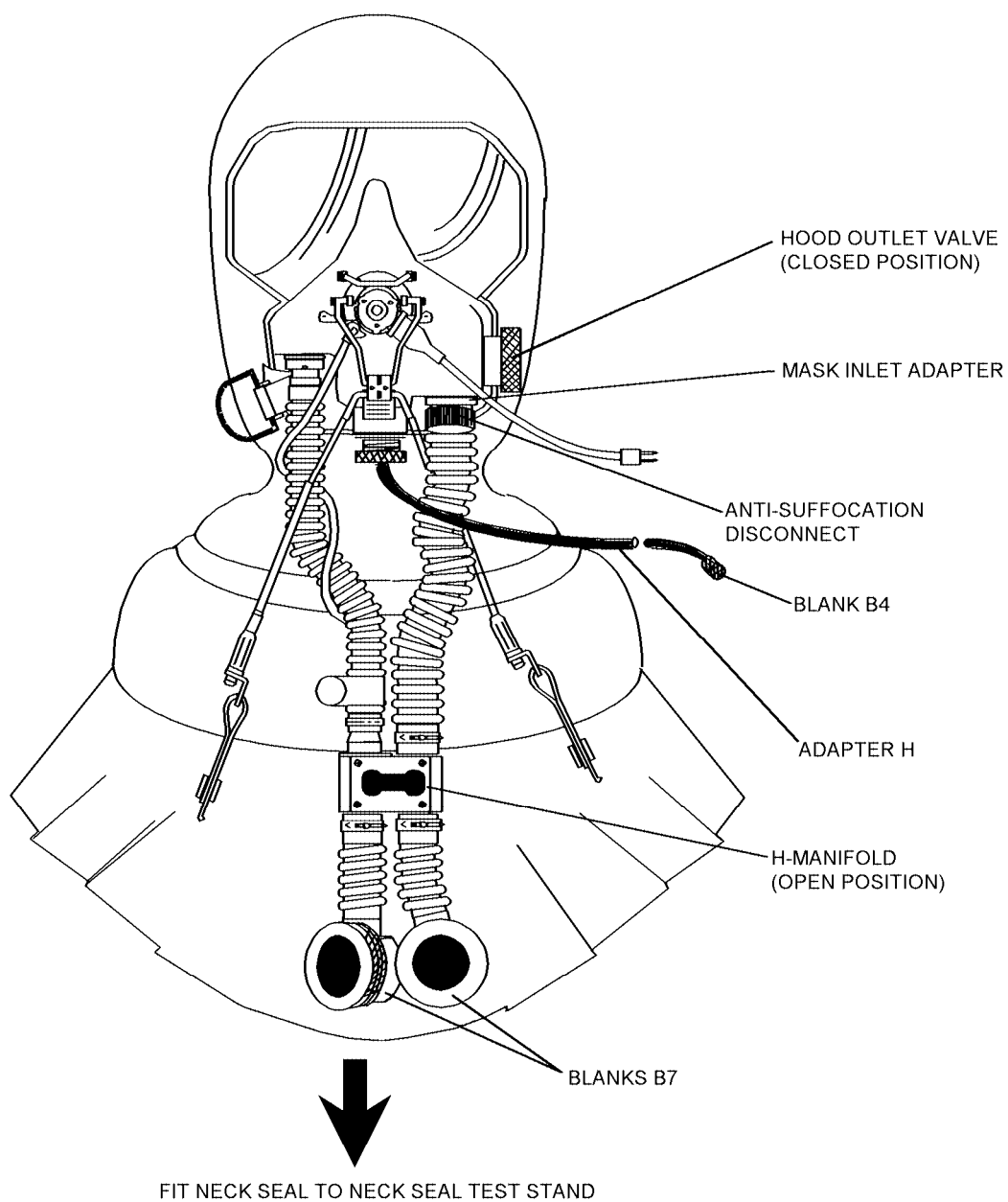


Figure 4-99. (V)2 thru (V)4 Variants - Mask Assembly - Overall Leakage Test

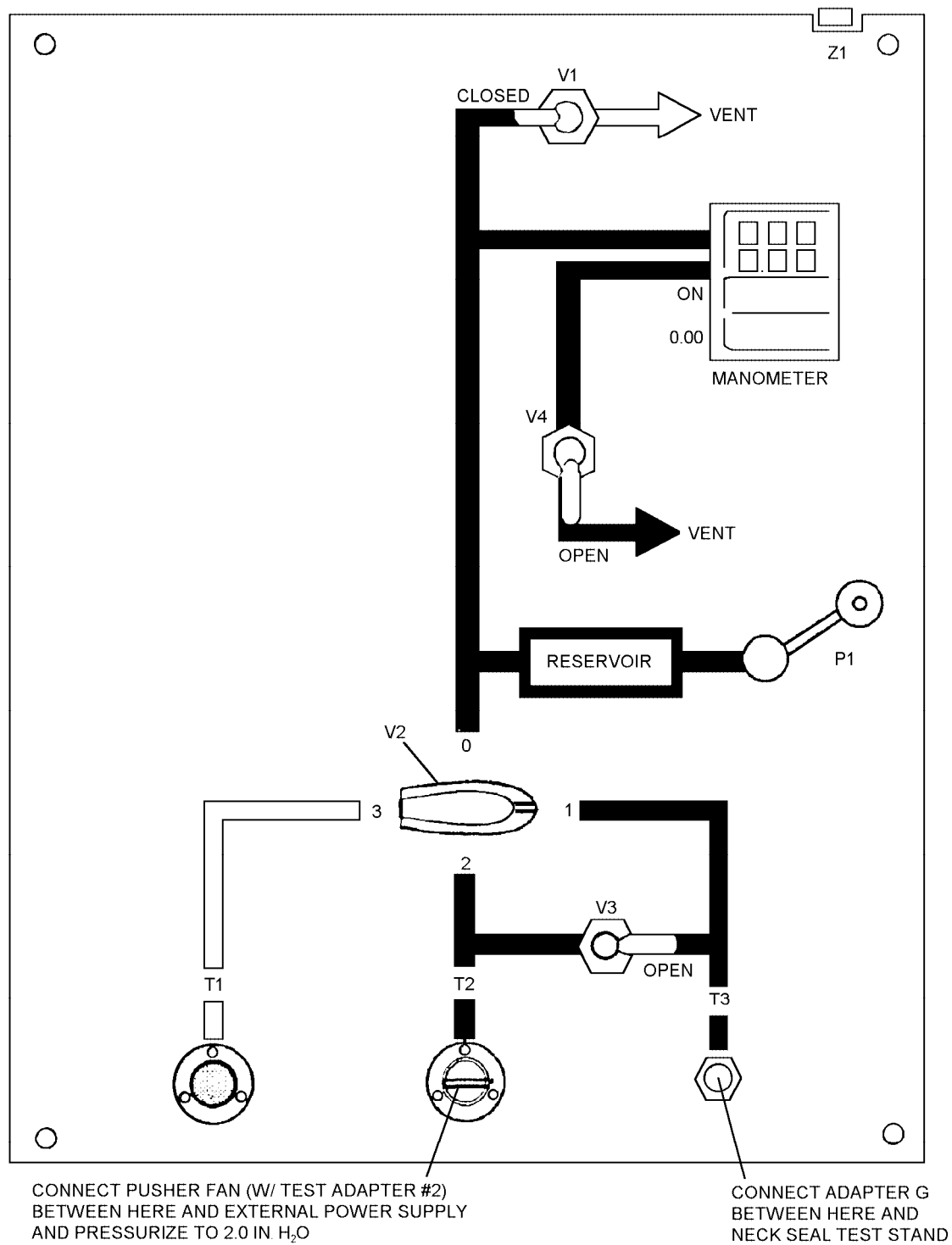


Figure 4-100. Mask Assembly - Overall Leakage Test

4-100

NOTE

If digital manometer does not read between 2.0 and 1.95 in. H₂O after one minute, refer to [table 4-4](#) for troubleshooting procedures.

17. Open hood outlet valve.
18. Set V1 to OPEN.
19. Disconnect pusher fan from power supply.
20. Disconnect adapter #2 from T2.
21. Remove adapter #2 from pusher fan.
22. Remove respirator from neck seal test stand.
23. Remove adapter G from T3 and neck seal test stand.
24. Remove adapter H and Blank B4.
25. Refit snout and secure with a 3.6 mm black cable tie. Tension with a cable tie tool set to STD setting. Position cable tie head close to mask.
26. Remove blank B7 from both J-manifolds.
27. Refit pusher fan assembly to right-side J-manifold.
28. Refit 90° rubber molding to left-side J-manifold.
29. Complete Performance Test Sheet.
30. Ensure shear screw is fit to anti-suffocation disconnect.

NOTE

The following test should only be performed to help isolate a leak in mask.

4-157. Hood Assembly - Overall Leakage Test.

1. Detach hood and mask inlet hoses from mask ([figure 4-101](#)).

2. Remove cable tie securing snout to faceplate. Remove snout.
3. Connect adapter H to the mask exhalation outlet valve port.
4. Slowly, fit blank B4 to free end of adapter H.
5. Support mask on hanger by its toggle harness.
6. Fit hood assembly to neck seal test stand and adjust neck seal to lie without creasing the sealing ring.
7. Close hood outlet valve.
8. Connect one end of adapter G to T3 and other end to neck seal test stand port ([figure 4-102](#)).
9. Fit blank B5 to mask inlet adapter.
10. Fit blank B6 to the hood inlet adapter
11. Remove pusher fan from right-side J-manifold.
12. Screw pusher fan canister into test adapter #2.
13. Connect test adapter #2 to T2.
14. Connect power supply to pusher fan and switch on. Ensure correct output settings.
15. Set V1 to CLOSED and V4 to OPEN.
16. Set V2 to 1 and V3 to OPEN position. Inflate hood until 2 in. H₂O is indicated on digital manometer.
17. Allow pressure within hood to stabilize if necessary, by adjusting V1 (opening and closing) to maintain 2 in. H₂O.
18. When stabilized, set V1 to CLOSED. In the event reading is too high, reduce pressure by opening hood outlet valve. Set pusher fan switch to OFF.
19. Observe pressure indicated on digital manometer. Pressure shall be between 1.95 and 2.0 in. H₂O during a one minute period. If manometer fails to indicate or if pressure is not between 1.95 and 2.0 in. H₂O, refer to [table 4-4](#) for troubleshooting procedures. Record results on Performance Test Sheet.

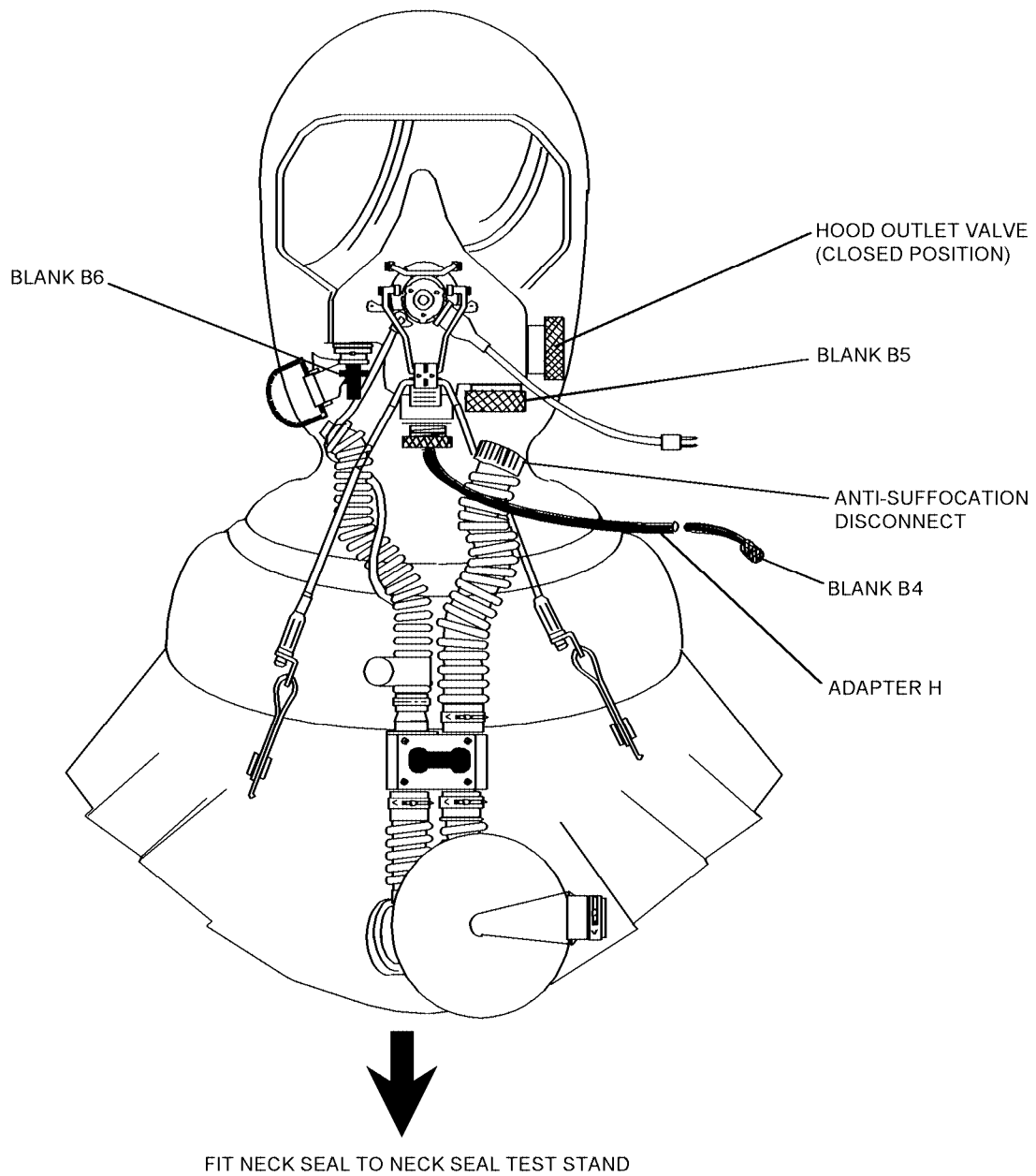


Figure 4-101. (V)2 thru (V)4 Variants - Hood Assembly - Overall Leakage Test

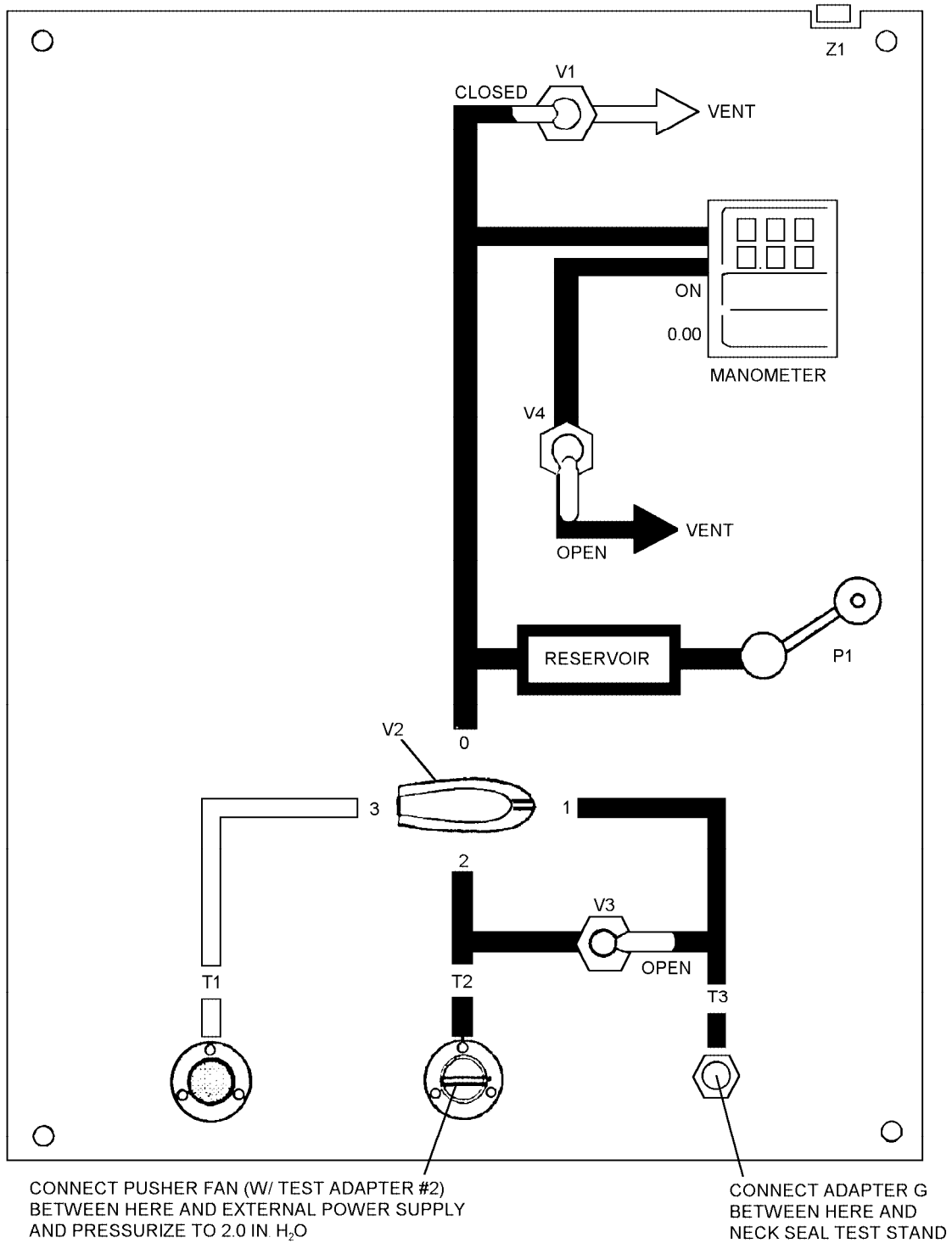


Figure 4-102. Hood Assembly - Overall Leakage Test

4-102

NAVAIR 13-1-6.10

20. Set V1 to OPEN.
 21. Open hood outlet valve.
 22. Disconnect test adapter #2 from T2 and disconnect pusher fan from external power supply.
 23. Remove the pusher fan from test adapter #2.
 24. Remove adapter G.
 25. Remove blanks B4, B5, and B6.
 26. Remove mask from neck seal stand and support hanger, and fit velveteen cover.
 27. Replace pusher fan to right-side J-manifold.
 28. Remove adapter H from exhalation valve port and remove blank B4.
 29. Refit hood and mask inlet hoses in accordance with assembly section.
 30. Refit snout.
- 4-158. RESPIRATOR ASSEMBLY TROUBLESHOOTING.** Refer to [table 4-4](#) for troubleshooting procedures.

Table 4-4. Respirator Assembly - Troubleshooting

Trouble	Probable Cause	Remedy
PUSHER FAN - PRESSURE TEST		
Digital manometer does not read at least 2.6 in. H ₂ O or nothing happens.	Incorrect output setting on power supply or incorrect wiring.	Adjust power setting to 3.75V @ 1 amp. and check wiring.
	Used lithium battery. Check usage and/or shelf life.	Replace with new battery.
	Adapter #2 leaking or loose connections on test set.	Check for leakage.
	Bad pusher fan motor.	Replace w/new pusher fan.
INHALATION AND HOOD INLET VALVE - REVERSE LEAKAGE TEST		
Digital manometer does not read between -2 and -4 in. H ₂ O after 7 sec.	Leakage through hood inlet valve.	Disconnect adapter M from mask inlet adapter only. Separate adapter E into two halves. Insert part A half into the open end of adapter M. Retest. If it passes, suspect inhalation valve. If it fails, remove and replace the H-manifold. There are no repairs authorized on the H-manifold or its internal components such as the hood inlet valve. Only an authorized manufacturer can open and reseal an H-manifold.
	Leakage through inhalation valve.	Disconnect anti-suffocation disconnect from adapter M. Insert blank B5 into open end of adapter M. Retest. If it passes, suspect hood inlet valve. If it fails, remove iceguard and examine stepped rubber valve. Clean or replace and retest.
	Leakage through adapter M, test connections or incorrect valve settings.	Check, repair or replace.
H-MANIFOLD INLET VALVE - REVERSE LEAKAGE TEST		
Digital manometer does not read between -2 and -4 in. H ₂ O after 7 sec.	Dirty or leaky valve.	Remove adapter K. Inhale and exhale lightly through the J-manifold to reseat the valve in the H-manifold. When inhaling, you should feel the valve being seated. If it fails again, replace the H-manifold.
	Loose connection or incorrect valve settings.	Check all connections for secure attachment. Check valve settings.

Table 4-4. Respirator Assembly - Troubleshooting (Cont)

Trouble	Probable Cause	Remedy
EXHALATION OUTLET VALVE - REVERSE LEAKAGE TEST		
Digital manometer does not read between 0.5 and 1.0 in. H ₂ O after 12 sec.	Dirty or leaky valve.	Remove stepped rubber valve from valve seat. Clean seat and valve, and retest. If it fails, replace and retest
	Loose connection or incorrect valve settings.	Check all connections for secure attachment. Check valve settings.
COMPENSATED EXHALATION VALVE		
Digital manometer does not read at least 2.6 in. H ₂ O.	Hood outlet valve open.	Select hood outlet valve to close position.
	Compensated exhalation valve faulty.	Examine valve plate for correct operation by gently depressing plate against spring tension several times to exercise valve. Replace valve if suspect. Make sure J-prop has not been left in valve from previous test.
	Neck seal not correctly seated on neck seat test stand.	Seat correctly.
	Pusher fan faulty or power supply not set to correct settings. Dead or low battery.	Ensure power supply is set at 3.75V @ 1 amp. If using battery, check battery life and/or shelf life. Service or replace with new battery as required.
	Incorrect valve settings or loose test connections.	Check all valve settings for correct settings and check all connections for security of attachment.
Digital manometer does not read less than 1.5 in. H ₂ O when adapter E is separated.	Valve plate stuck.	Examine valve plate. Replace valve if suspect.

Table 4-4. Respirator Assembly - Troubleshooting (Cont)

Trouble	Probable Cause	Remedy
MASK ASSEMBLY - OVERALL LEAKAGE TEST		
Digital manometer does not read between 1.95 and 2.0 in. H ₂ O.	Incorrect valve settings or loose test connections.	Check all valve settings for correct settings and check all connections for security of attachment.
	Pusher fan faulty or power supply not set to correct settings. Dead or low battery.	Ensure power supply is set at 3.75V @ 1 amp. If using battery, check battery life and/or shelf life. Service or replace with new battery.
	Neck seal not correctly seated on neck seal test stand.	Seat correctly.
	Hood outlet valve open or valve not seated correctly.	Seat valve to closed position. Examine for dirt/dust. Clean as necessary.
	Hole/split in rubber cowl or neck dam.	Examine for tears/holes. Replace if tears/holes are present.
	Holes/splits in mask inlet hose or hood inlet hose.	Examine for tears/holes. Replace if tears or holes are present.
	Occluded mask or hood inlet hose.	Ensure hoses are free from kinks.
	Drink Facility.	Examine for leaks and security of attachment.

Table 4-4. Respirator Assembly - Troubleshooting (Cont)

Trouble	Probable Cause	Remedy
HOOD ASSEMBLY - OVERALL LEAKAGE TEST		
Digital manometer does not read between 1.95 and 2.0 in. H ₂ O.	Pusher fan faulty or power supply not set to correct settings. Dead or low battery.	Ensure power supply is set at 3.75V @ 1 amp. If using battery, check battery life and/or shelf life. Service or replace with new battery as required.
	Neck seal not correctly seated on neck seal test stand.	Seat correctly.
	Hood outlet valve open or valve not seated correctly.	Select valve to closed position. Examine for dirt/dust. Clean as necessary.
	Hole/split in rubber cowl or neck dam.	Examine for tears/holes. Replace if tears/holes are present.
	Incorrect valve settings or loose test connections.	Check all valve settings for correct settings and check all connections for security of attachment.

4-159. DISASSEMBLY.

4-160. Instructions for disassembling the A/P22P-14(V)1 through (V)4 respirator assemblies are contained in the following paragraphs. Disassemble respirator assembly only as far as is required to correct malfunctions. The disassembly instructions can be followed in sequence for complete disassembly, or each step can be done separately, as required for that specific part or subassembly. All damaged or affected parts shall be replaced when the respirator assembly is disassembled. All replacement parts shall have the same part number as the damaged or removed part. To disassemble respirator assembly or any of its components, proceed as follows:

CAUTION

Only parts listed in the [Illustrated Parts Breakdown \(IPB\)](#) are authorized to be disassembled.

Materials Required

Quantity	Description	Reference Number
As Required	Latex Coating, SPRAYLAT A	NIIN 00-598-5941

Support Equipment Required

Quantity	Description	Reference Number
1	Screwdriver, Jewelers	—
1	Pliers, side cutting, 4-in.	—
1	Screwdriver, 6 X 1/8-in. Std.	—
1	Socket, 8 mm (12 pt., 1/4 drive)	NIIN 01-031-0702
1	Pliers, flat nose, 4 3/4-in.	—
1	Wrench, socket, 1/4-in. square drive	—
1	Nut driver, 3/8-inch	GGG-W-657
1	Pincer Tool, Low Profile	Oetiker 14100055
	or	
1	Pliers, Hose Clamp	NIIN 01-073-4187

CAUTION

All replacement/disassembly, inspection, repair, and assembly must be done on benches having good lighting.

Apply a latex coating to the outside visual area of faceplate before disassembly to protect optical area of faceplate from damage. The velveteen cover may be installed over the visual area when latex coating (SPRAYLAT) is not available or time is not sufficient to permit drying.

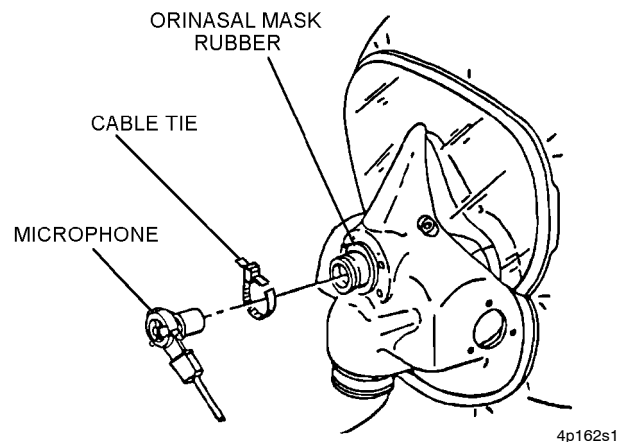
4-161. MASK COMPONENTS REMOVAL.**4-162. Microphone Removal.**

1. Using side cutting pliers, remove and discard cable tie that clamps orinasal mask rubber to microphone, taking care not to damage orinasal mask rubber.

CAUTION

Do not use microphone wire as a lever to remove microphone - it will break.

2. Carefully remove microphone from orinasal mask by twisting exposed portion of microphone, while at the same time, pushing microphone out from inside of orinasal mask.



Steps 1 and 2 - Para 4-162

4p162s1

4-163. Snout Removal.

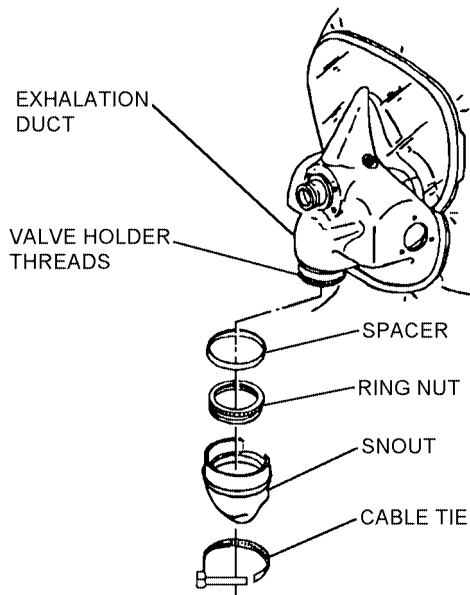
1. Remove rubber snout by cutting cable tie and easing snout from ring nut of exhalation outlet valve holder.

2. If removing orinasal mask, remove ring nut and spacer that clamps orinasal mask to faceplate.

4-164. Drink Facility Removal.



Be careful not to damage external drink tube when removing cable tie. If drink tube is cut, nicked, or damaged in any way, discard and replace with new drink tube.



Steps 1 and 2 - Para 4-163

4p163s1

NOTE

In order to remove Drink Facility Assembly from mask, orinasal mask removal will be required.

1. If not previously accomplished, remove microphone by first cutting cable tie securing it in orinasal mask cavity, then gently pushing it out of cavity from inside hood.

2. Invert hood to expose orinasal mask.

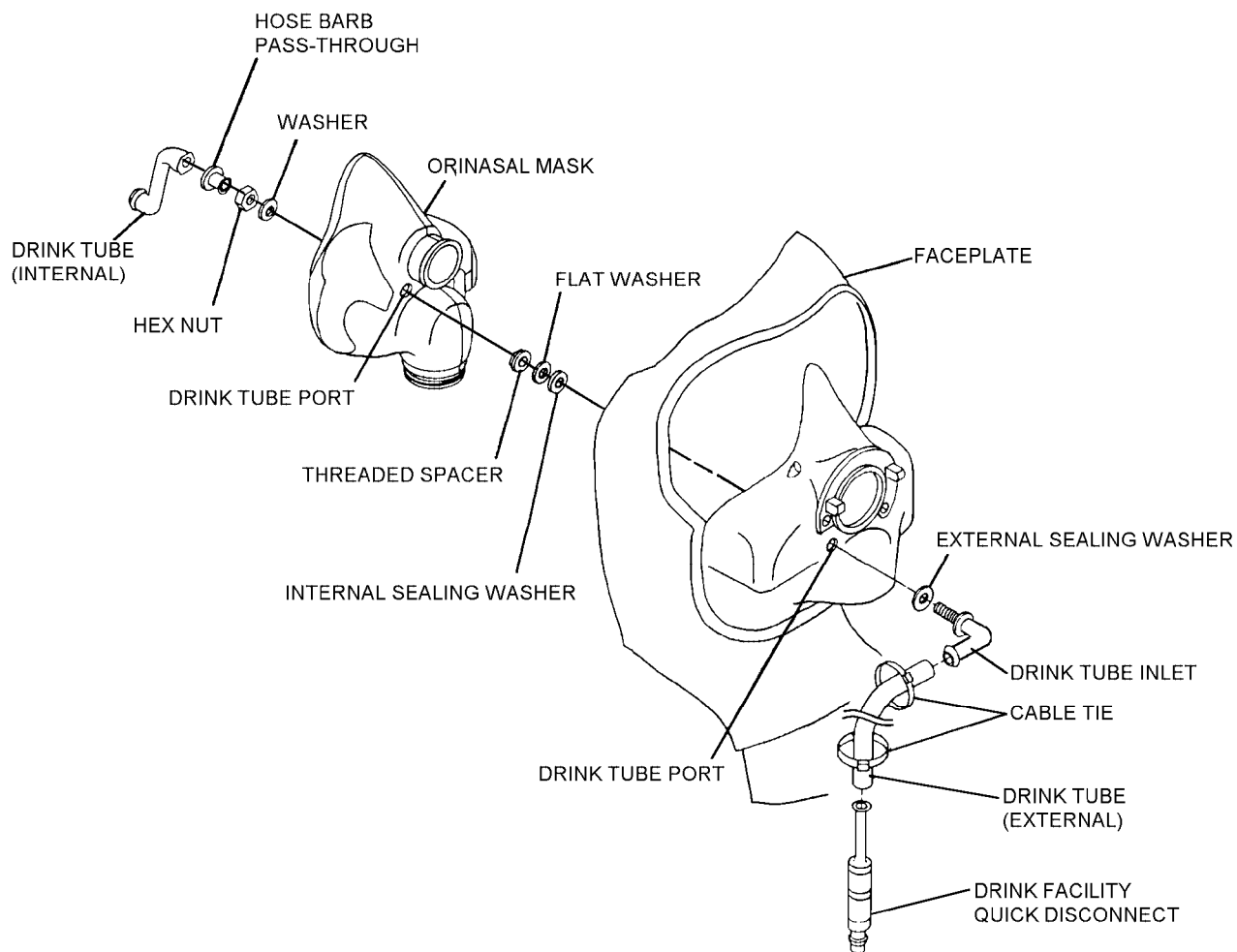
3. Carefully remove internal drink tube from hose barb pass through.

4. Using a 3/8-inch nut driver, remove and retain hose barb pass through and underlying hex nut from drink tube inlet. Remove and retain flat metal washer from drink tube inlet.

5. Carefully pull orinasal mask over threaded end of drink tube inlet in order to expose threaded spacer, flat metal washer and internal sealing washer between orinasal mask and faceplate.

6. Using a 3/8-inch nut driver, remove and retain threaded spacer. Remove and retain flat metal washer and internal sealing washer.

7. Remove drink tube inlet and external sealing washer from outside of faceplate, by pulling it away from faceplate.



Steps 1 thru 7 - Para 4-164

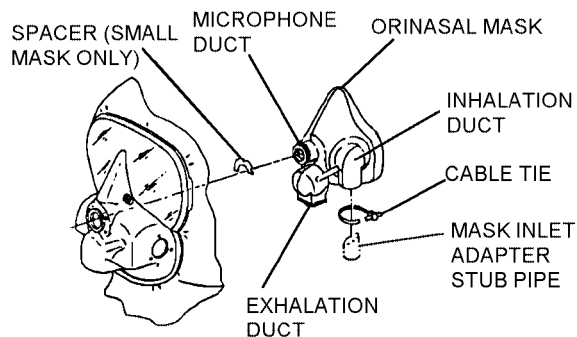
4p164s1

4-165. Orinasal Mask Removal.



Ensure components in paragraphs 4-162 and 4-163 have been removed prior to removing orinasal mask.

1. Invert hood to expose orinasal mask.
2. Cut, remove, and discard cable tie securing orinasal mask inhalation duct to mask inlet adapter.
3. Remove orinasal mask from within faceplate. If disassembling Small size orinasal mask, remove and retain spacer.



4p165s2

Steps 2 and 3 - Para 4-165

4. Remove orinasal mask deflector plate, if required.
5. If needed, complete disassembly of drink tube assembly.

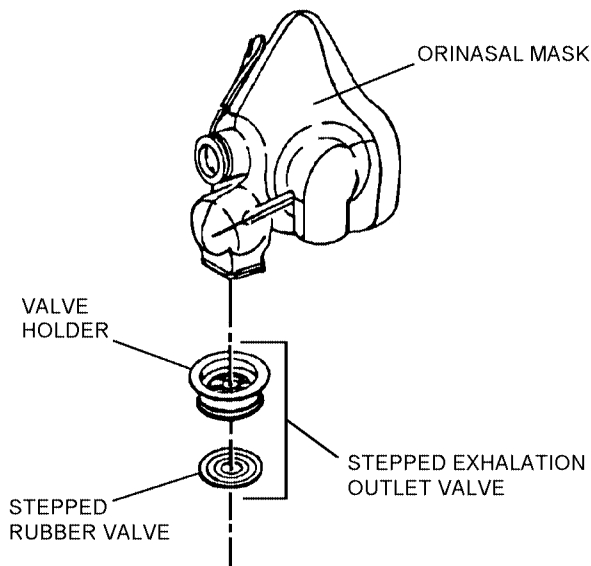


Ensure components in paragraphs 4-162 through 4-164 have been removed prior to removing exhalation outlet valve.

4-166. Exhalation Outlet Valve Removal. Ease the exhalation outlet valve from the orinasal mask duct.

NOTE

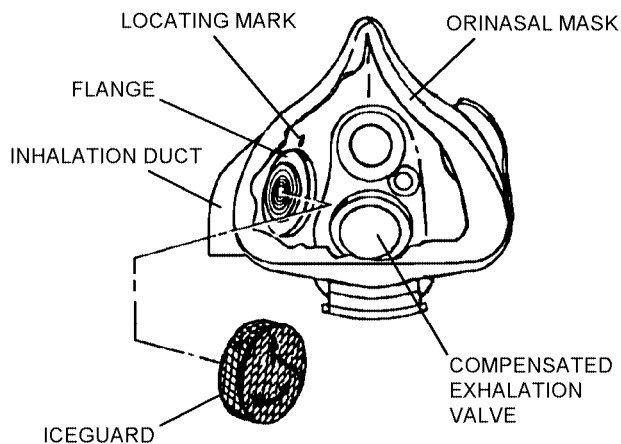
If only stepped rubber valve is to be removed, it is not necessary to complete paragraphs 4-162 or 4-164. Carefully pull valve off valve holder.



Para 4-166

4p166

4-167. Iceguard Removal. Remove iceguard by rotating iceguard body until engraved arrow is in line with mark molded on orinasal mask interior.



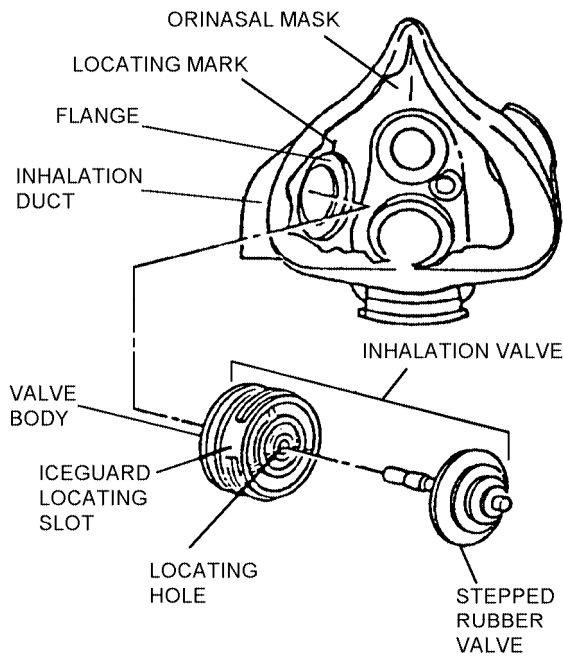
Para 4-167

4p167



Ensure iceguard has been removed as specified in [paragraph 4-167](#).

4-168. Inhalation Valve Removal. Remove inhalation valve by easing its valve body from securing flange of orinasal mask.



Para 4-168

4p168

4-169. Compensated Exhalation Valve Removal.



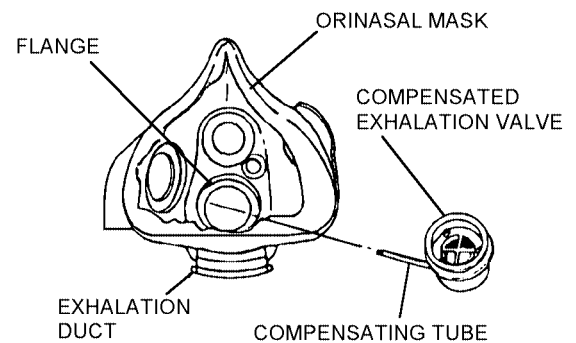
Ensure orinasal mask has been removed as specified in [paragraph 4-165](#).

1. Remove compensated exhalation valve body from its securing flange by gently pushing into orinal mask cavity from exhalation duct.

2. Carefully withdraw compensating tube from within connecting passage.

NOTE

Compensated exhalation valve is not to be dismantled. If defective, valve assembly shall be replaced.



4p169s1

Steps 1 and 2 - Para 4-169

4-170. Mask Inlet Hose/Anti-Suffocation Disconnect Removal.

1. Remove shear screw (brass) from anti-suffocation disconnect and disengage mask inlet hose from mask inlet adapter.

2. Untie restraint cord from within anti-suffocation disconnect.

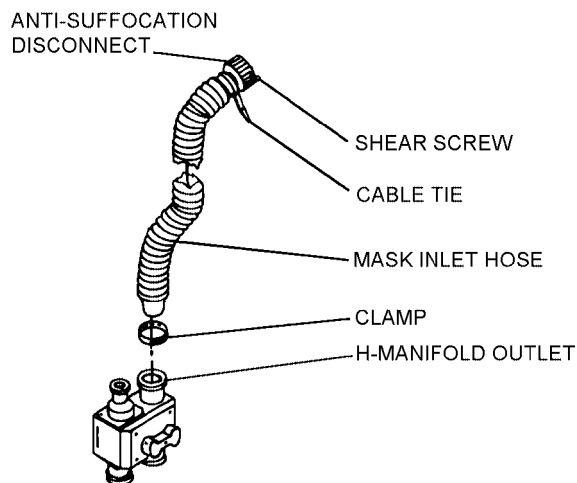
3. Cut, remove, and discard cable tie securing mask inlet hose to anti-suffocation disconnect.

4. Pry mask inlet hose from anti-suffocation disconnect.

NAVAIR 13-1-6.10

5. Using low profile pincer, remove and retain stepless low profile clamp securing mask inlet hose to H-manifold outlet port.

6. Remove mask inlet hose from manifold, discard and replace if damaged.



Steps 3, 5, and 6 - Para 4-170

4p170s3

4-171. Mask Inlet Adapter Removal.

1. Remove shear screw (brass) from anti-suffocation disconnect. Disengage anti-suffocation disconnect from mask inlet adapter.

2. Remove two screws securing mask inlet adapter to faceplate.

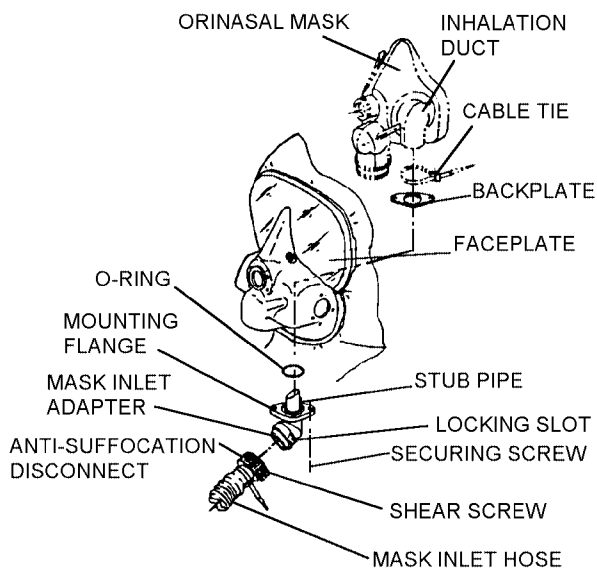
3. Invert hood to expose inner side of mask.

4. Cut and discard cable tie securing orinasal mask to mask inlet adapter if not previously done in [paragraph 4-165](#).

5. Withdraw mask inlet adapter from faceplate.

6. Remove backplate.

7. Remove and discard sealing O-ring.



Steps 4 thru 7 - Para 4-171

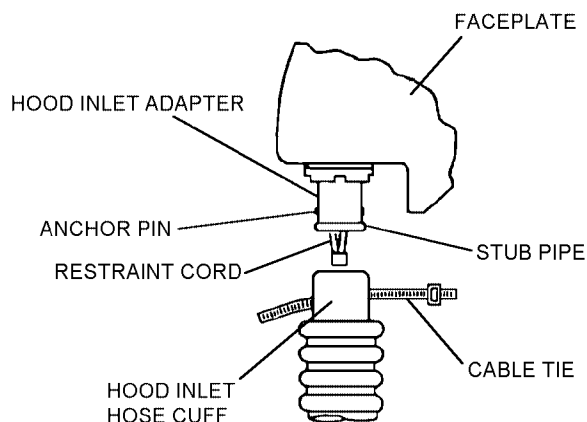
4p171s4

4-172. Hood Inlet Hose Removal.

1. Cut, remove, and discard the cable tie securing hood inlet hose to hood inlet adapter.

2. Pry hood inlet hose off hood inlet adapter.

3. Withdraw and retain hood inlet hose restraint cord anchor pin from within duct of hood inlet adapter using flat nose pliers.

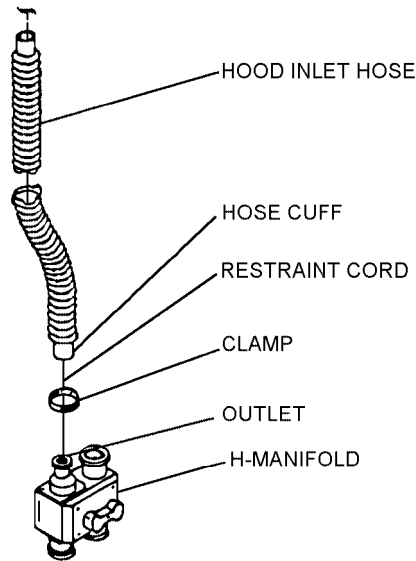


Steps 1 thru 3 - Para 4-172

4p172s1

4. Using low profile pincer, remove stepless low profile clamp securing hood inlet hose to H-manifold port.

5. Ease hood inlet hose from manifold and remove hood inlet hose. Leave restraint cord attached to manifold.



Steps 4 and 5 - Para 4-172

4p172s4

6. If damaged, discard and replace hood inlet hose.

4-173. Hood Inlet Adapter Removal.

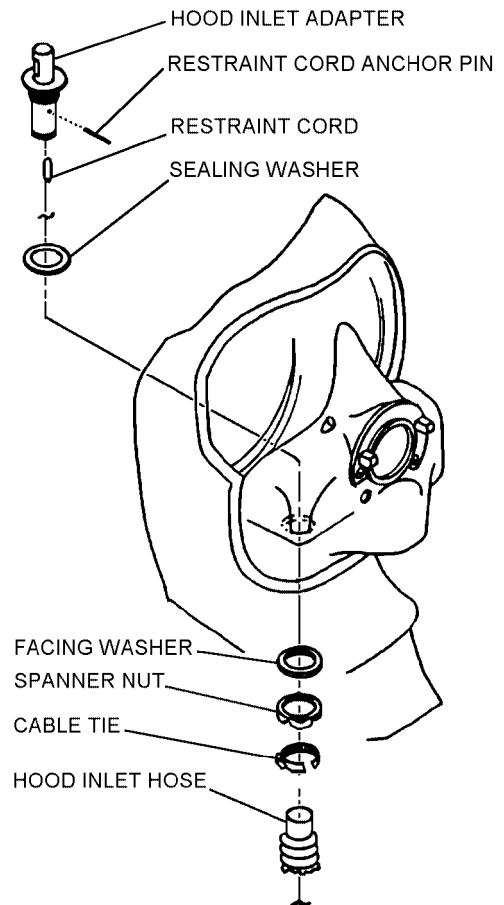
1. Remove hood inlet hose as specified in [paragraph 4-172](#) if not already done.

2. Remove hood inlet spanner nut securing hood inlet adapter to faceplate.

3. Remove facing washer.

4. Invert hood to expose inner side of mask.

5. Remove hood inlet adapter and discard sealing washer.



Steps 2, 3, and 5 - Para 4-173

4p173s2

4-174. Hood Outlet Valve Removal.

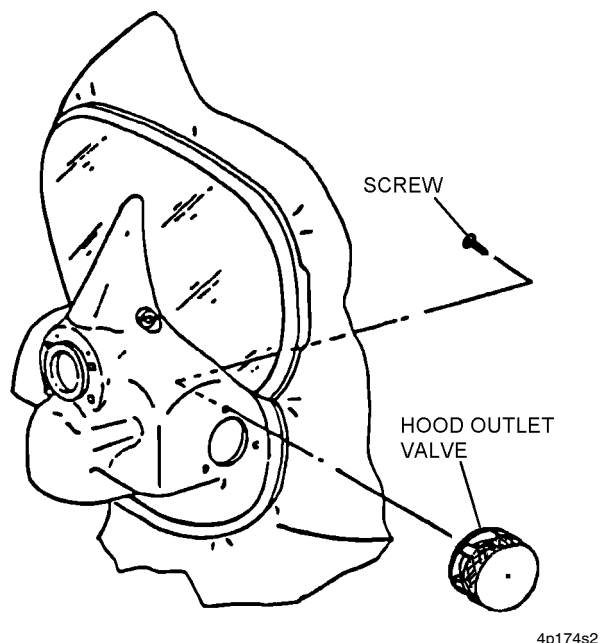


Ensure orinasal mask has been removed as specified in [paragraph 4-165](#).

1. Invert hood to expose inner side of mask.

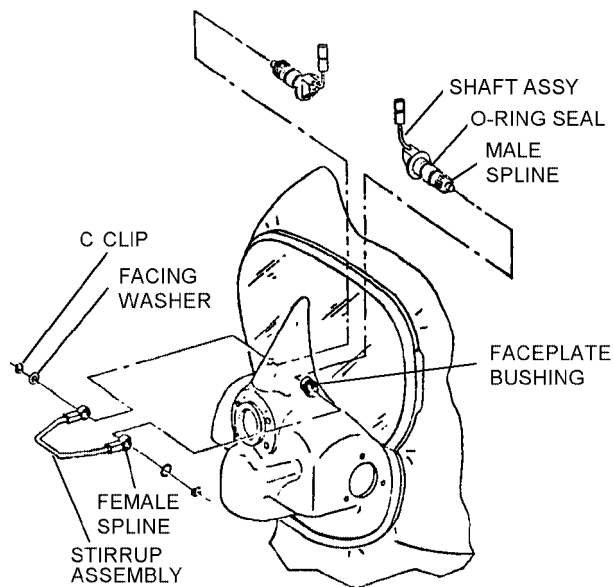
2. Remove and retain three screws securing hood outlet valve to faceplate.

3. Remove valve assembly.



Steps 2 and 3 - Para 4-174

4p174s2



Steps 1 thru 6 - Para 4-175

4p175s1

4-176. Toggle Harness Removal.



Ensure orinasal mask has been removed as specified in [paragraph 4-165](#).

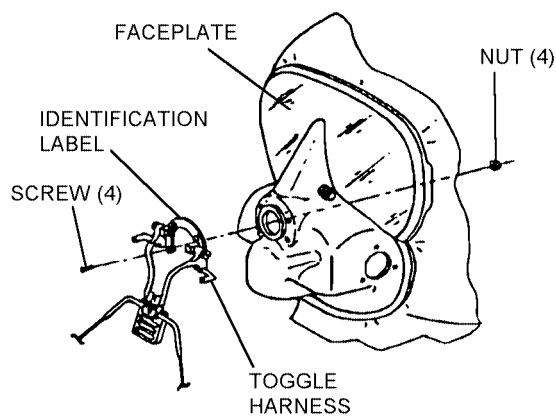
1. Invert hood to expose inner side of mask.
2. Remove four screws and nuts securing toggle harness to faceplate. Retain hardware.

NOTE

In order to maintain clarity of the visual presentation, toggle harness and nose occluder assemblies will be illustrated only in steps pertaining to these components.

4-175. Nose Occluder Removal.

1. Remove C-clips from the nose occluder stirrup.
2. Remove facing washers.
3. Invert hood to expose inner side of mask.
4. Ease shaft assembly through nose occluder stirrup, then through faceplate bushing.
5. Remove shaft assembly from mask.



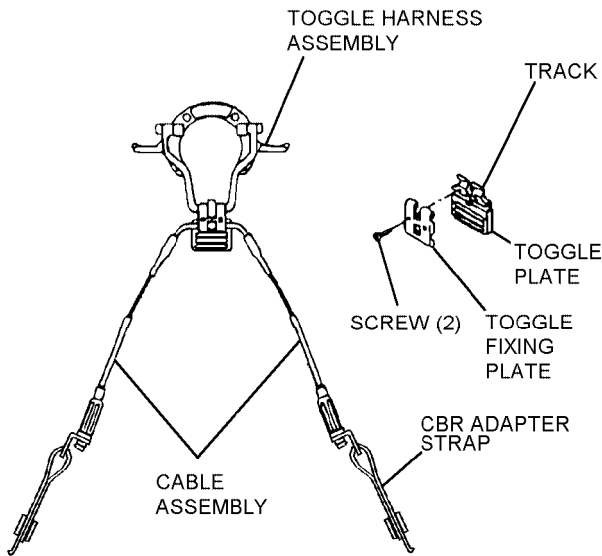
Steps 1 and 2 - Para 4-176

4p176s1

6. Remove two rubber O-rings seals from shaft assembly and discard.

3. Remove two screws securing the toggle plate and toggle fixing plate to toggle harness assembly.

4. Remove the two cable assemblies.



Steps 3 and 4 - Para 4-176

4p176s3

4-177. LOWER ASSEMBLY.

4-178. H-Manifold (figure 4-103).

4-179. Mask Inlet Hose Removal.

1. Carefully open and remove clamp securing mask inlet hose to left-side outlet port so as not to damage mask inlet hose or outlet port.

2. Remove mask inlet hose from left-side outlet port.

4-180. Hood Inlet Hose Removal.

1. Carefully open and remove the clamp securing hood inlet hose to right-side outlet port so as not to damage hood inlet hose or outlet port.

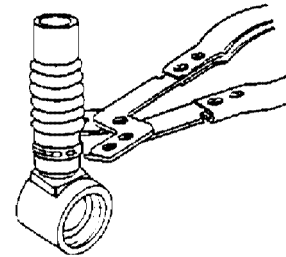
2. Remove hood inlet hose from right-side outlet port.

4-181. Manifold Hose(s) Removal.

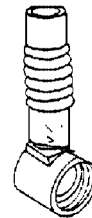
1. Carefully open and remove clamp(s) securing manifold hose(s) to inlet port(s) so as not to damage inlet port(s).

2. Pull the manifold hose(s) off inlet port(s) and retain manifold hose(s) for further disassembly.

3. Carefully remove manifold hose(s) from J-manifold(s) in a similar manner.



↑ PULL



Steps 1 thru 3 - Para 4-181

4p181s1

4-182. Blanking Cap ((V)1 Variant only) Removal.

1. Carefully remove clamp securing blanking cap to H-manifold.

2. Remove blanking cap from left side inlet port.

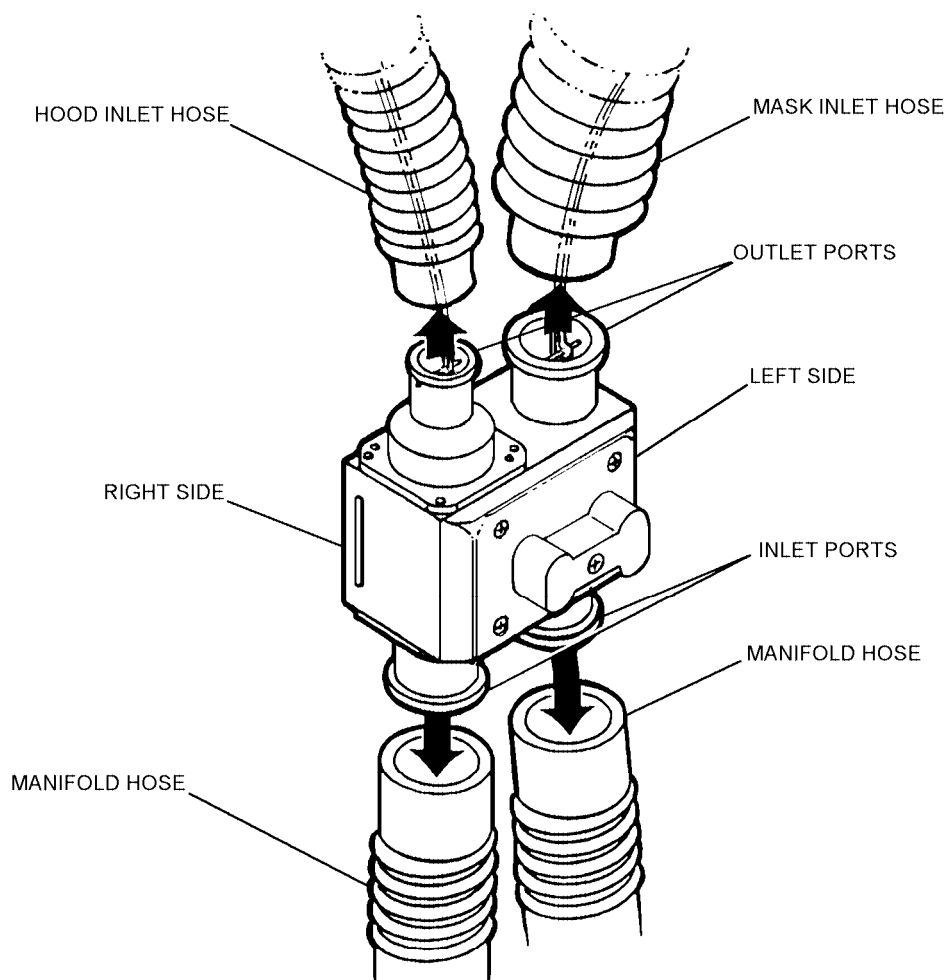


Figure 4-103. H-Manifold Hose Removal

4-103

NOTE

The following procedures also apply to the 90° rubber molding and canister.

2. Pull pusher fan off canister. Retain pusher fan and canister.

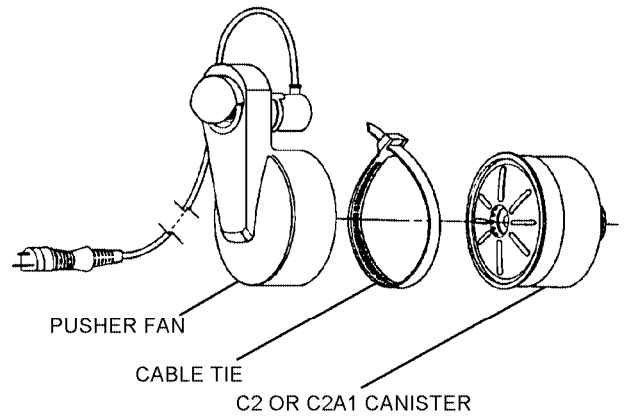
4-183. J-Manifold and Gasket Removal.

1. Unscrew J-manifold from C2 or C2A1 canister.
2. Pull J-manifold gasket from threaded end of J-manifold. Retain J-manifold and gasket.

4-184. Pusher Fan Subassembly.

- 4-185. Pusher Fan and C2 or C2A1 Canister Removal.

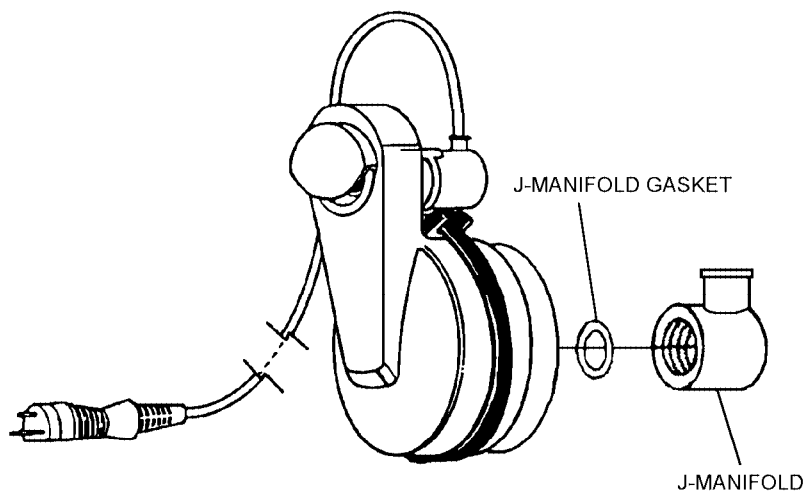
1. Carefully cut, remove, and discard 18 inch cable tie securing pusher fan to C2 or C2A1 canister.



4p185s1

Steps 1 and 2 - Para 4-185

- 4-186. Pusher Fan Battery Pack Removal. Disconnect battery pack from pusher fan. Retain battery for storage.

**Steps 1 and 2 - Para 4-183**

4p183s1

4-187. Oxygen Delivery Subassembly Disassembly ((V)2 through (V)4 only).

4-188. 90° Rubber Molding and C2 or C2A1 Canister.

1. Carefully cut, remove, and discard cable tie securing 90° rubber molding to canister so as not to damage 90° rubber molding or canister.
2. Pull 90° rubber molding from canister. Retain 90° rubber molding and canister.

4-189. LOX Variant.

1. Carefully open and remove clamp securing 90° rubber molding to 3/4 inch - 3/4 inch coupling.
2. Carefully pry coupling from 90° rubber molding.

3. Carefully open and remove the clamp securing coupling to regulator hose.

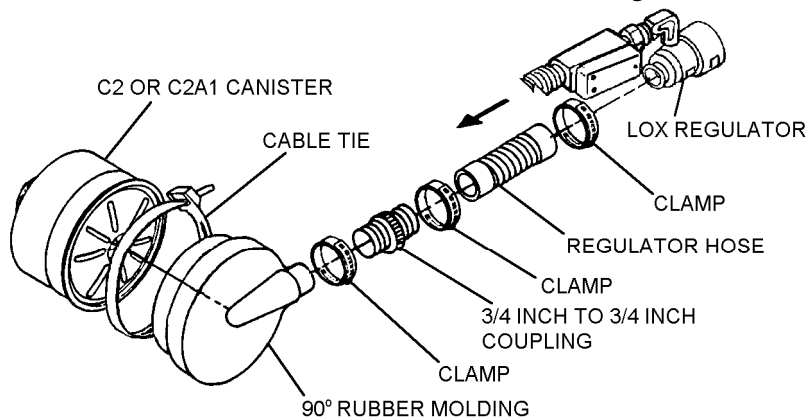
4. Similarly, open and remove clamp from regulator hose/LOX regulator connection. Retain all clamps, coupling, and regulator hose.

4-190. OBOGS Variant.

1. Carefully open and remove clamp securing the 90° rubber molding to bayonet connector.

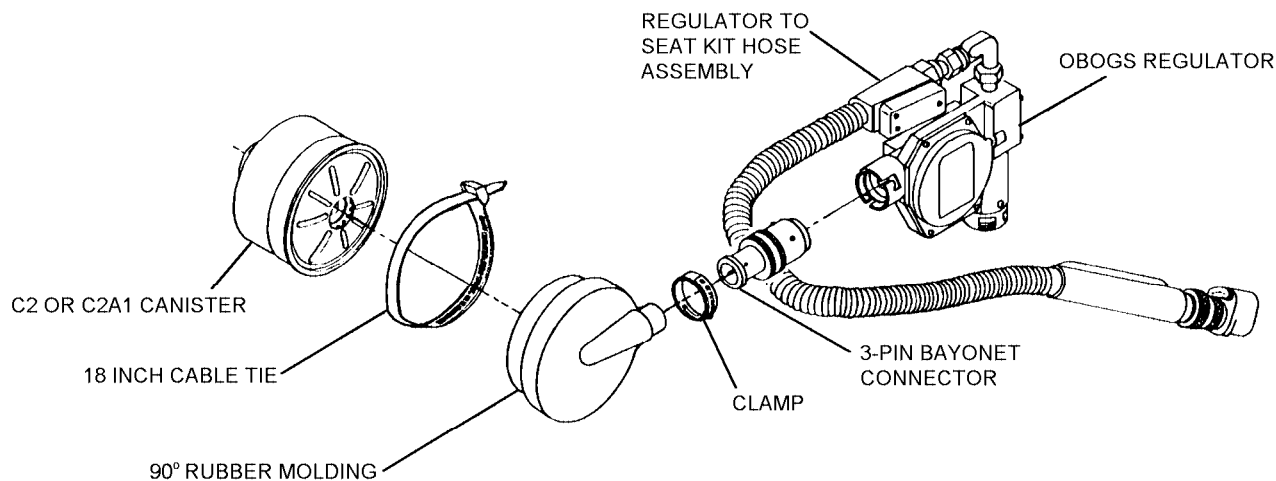
2. Disconnect bayonet connector from OBOGS regulator.

4-191. Panel Mounted Variant. Carefully open and remove clamp securing 90° rubber molding to quick disconnect fitting.



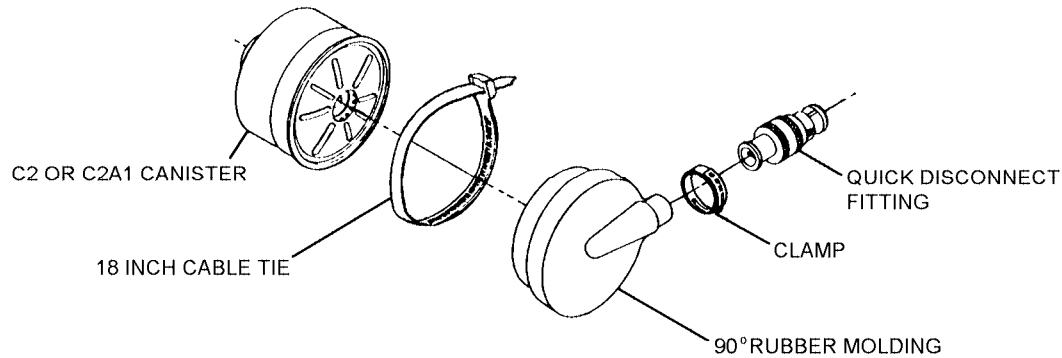
Steps 1 thru 4 - Para 4-189

4p189s1



Steps 1 and 2 - Para 4-190

4p190s1



Para 4-191

4p191

4-192. CLEANING OF DISASSEMBLED COMPONENTS.

4-193. Disassembled component parts of the A/P22P-14(V)1 through (V)4 respirator assemblies shall be thoroughly cleaned to remove all traces of sealing compound, sealing varnish, lubricant, and other foreign matter such as dirt, sand, dried liquid nourishment, or vomit. If internal compartments of valves and hoses cannot be thoroughly cleaned, they shall be replaced. Cleaning of the disassembled mask shall be performed by a qualified Aircrew Survival Equipmentman (PR). Cleaning procedures are as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Toothpick	—
As Required	Swab, Cotton	—
As Required	Soap Mild	—
As Required	Cloth, Cotton	—
As Required	Pad, Gauze	—
As Required	Solvent, Toluene	NIIN 00-281-2002
As Required	Alcohol, Isopropyl Rubbing	TT-I-735 NIIN 00-655-8366
1	Brush, Sable	—
As Required	Water	—
As Required	Towelettes, SANI-COM,	No. 3205 (CAGE 18195)
As Required	Bleach, Laundry	A-A-1427 NIIN 00-598-7316
As Required	Cleaner, Tobacco Pipe	—

Materials Required (Cont)

Quantity	Description	Reference Number
1	Brush, Acid	NIIN 00-514-2417
As Required	Cleaning Compound, Type I	MIL-C-43616
As Required	Cloth, Abrasive	—
As Required	Cloth, Cotton	—
1 pr.	Gloves, Acrylonitrile rubber or Neoprene	—

CAUTION

When cleaning mask, do not allow solvent to come in contact with faceplate.

NOTE

Velveteen covers are not to be used for cleaning or polishing.

4-194. MASK ASSEMBLY CLEANING.

4-195. Toggle Harness Cleaning.

1. Remove all traces of sealing compound using a gauze pad. If necessary, gently scrape sealing compound with fingernail or toothpick to loosen it.

2. Remove sealing compound from toggle harness and four attaching screws in a similar manner.

4-196. Nose Occluder Cleaning.

1. Clean lubricant from nose occluder shaft assemblies and faceplate bushings with a cotton swab using mild soap and warm water.

2. Rinse soap from shaft assemblies using a cotton swab and warm water.

3. Wipe shaft assemblies with a clean dry cloth. Allow to air dry completely.

4-197. Hood Outlet Valve Cleaning.

1. Remove all traces of sealing compound from around the areas of hood outlet valve port of faceplate using a gauze pad. If necessary, gently scrape sealing compound with fingernail or toothpick to loosen it.

2. Remove sealing compound from hood outlet valve and three attaching screws in a similar manner.

4-198. Hood Inlet Adapter Cleaning.

1. Remove any traces of sealing varnish from outer surface of hood inlet adapter using a gauze pad moistened with solvent.

2. Wipe cleaned surfaces dry using a clean, dry gauze pad.

4-199. H-Manifold Ports Cleaning.

1. Clean surface of manifold outlet ports using a gauze pad moistened with water.

2. Wipe cleaned surfaces dry using a clean, dry gauze pad.

4-200. Mask Inlet Adapter Cleaning.

1. Remove all traces of sealing compound from around the areas of mask inlet adapter using a gauze pad. If necessary, gently scrape sealing compound with fingernail or toothpick to loosen it.

2. Remove sealing compound from mask inlet adapter and attaching screws in a similar manner.

4-201. Anti-Suffocation Disconnect Cleaning.

1. Remove any traces of sealing varnish from outer surface of the anti-suffocation disconnect using a gauze pad moistened with solvent.

2. Wipe the cleaned surfaces dry using a clean, dry gauze pad.



Compensated exhalation valve must be removed from orinasal mask before internal cleaning with isopropyl alcohol.

4-202. Compensated Exhalation Valve Cleaning.

1. Add isopropyl alcohol to a container of sufficient size to partially submerge compensated exhalation valve.

NOTE

Valve plate cannot be depressed while compensating tube is covered.

2. Cover end of compensating tube with finger to prevent alcohol from entering tube.

3. Submerge valve in alcohol and use a sable brush to gently clean valve.

4. Gently shake excess alcohol from valve and allow to air dry.

4-203. Inhalation Valve Cleaning.



Do not clean inhalation or exhalation valves with SANI-COM towelettes or sanitizing solution.

1. Ensure iceguard is removed and then gently lift valve with finger and clean underside of valve and valve seat with a sable brush moistened with water.

2. Clean top of valve in same manner.

3. Allow to air dry.

4. Clean iceguard with a sable brush and water to remove any foreign particles from mesh.

5. Allow to air dry.

4-204. Snout and Exhalation Outlet Valve Cleaning.

1. Grasp raised rubber knob at valve center and pull valve off its seating pin.

CAUTION

Do not clean inhalation or exhalation valves with SANI-COM towelettes or sanitizing solution.

2. Clean both sides of valve, and valve seat using a sable brush moistened with water.
3. Set valve aside to air dry with knob side of valve facing down on bench. Allow valve seat area to air dry.
4. Reinstall valve on seating pin, ensuring it is fully seated on pin.
5. Clean snout with a gauze pad moistened with water.
6. Wipe dry with a clean, dry cotton cloth.

4-205. Drink Tube Cleaning.

1. Remove all traces of sealing compound from drink tube's mounting flange, backing plate, hex nut, and screw using a gauze pad. If necessary, gently scrape sealing compound with fingernail or toothpick to loosen it.
2. Remove all traces of sealing compound from faceplate's drink tube port in a similar manner.

4-206. Orinal Mask Cleaning.

1. Clean internal surfaces of the orinal mask with cleansing towelettes (SANI-COM No. 3205) being sure to wipe under rolled-over edges of orinal mask.
2. Wipe microphone with a towelette.
3. Allow to air dry.

4-207. Faceplate, Hood, Hoses, Apron, and Neck Seal Cleaning.**CAUTION**

Abrasive cleaners, adhesives, and solvents must not be applied to visual areas of faceplate. Velveteen covers are not to be used for cleaning or polishing.

CAUTION

Damage or scratches to the faceplate cannot be repaired. Use care when cleaning the faceplate.

1. Clean the inner visual area of the faceplate using water with a soft cotton cloth or dampened cham-
ois.
2. Wipe faceplate with clean, dry cotton cloth to remove excess water.
3. Allow to air dry.
4. Clean interior and exterior surfaces of hood, apron, and neck seal with a gauze pad moistened with water.
5. Clean all hoses with a gauze pad moistened with water.
6. Wipe excess water from hood, hoses, apron, and neck seal using a clean, dry cotton cloth.
7. Allow to air dry.

4-208. LOWER ASSEMBLY CLEANING.**4-209. H-Manifold Cleaning.**

1. Clean exterior surfaces, including (V)1 blanking plug, with gauze pad moistened in a solution of mild soap and water.
2. Remove soap residue with a gauze pad moistened with water.
3. Ensure ports have been cleaned in accordance with [paragraph 4-199](#). Allow to air dry.

4-210. Pusher Fan Subassembly Cleaning.

4-211. J-Manifold and Gasket Cleaning. Clean J-manifold gasket using a gauze pad moistened with distilled water and allow to air dry. Wipe cleaned surfaces dry using a clean dry gauze pad.

4-212. Pusher Fan. Carefully cut 18 inch cable tie that secures C2 or C2A1 canister to pusher fan. Remove canister from pusher fan. Clean internal and external surfaces of pusher fan with cleansing towelettes. Moisten gauze pad with a 10% sanitizing solution of laundry bleach and water and squeeze to remove excess to prevent dripping. Wipe pusher fan interior and pusher fan inlet. Allow to air dry.

4-213. Canister. Clean, using a cleansing towelette to remove dirt, grime or any other debris from external surfaces or threads. Wipe cleaned surfaces dry using a clean dry gauze pad. Be sure no moisture remains inside canister.

4-214. Battery. Clean, using a cleansing towelette to remove dirt, grime or any other debris from external surfaces. If dirt or debris is found in battery receptacle, it should be removed using a toothpick or pipe cleaner. If 3-pin receptacle is corroded, battery pack should be replaced. Wipe cleaned surfaces dry using a clean dry gauze pad.

4-215. Oxygen Delivery Subassembly Cleaning.

1. 90° rubber molding. Clean 90° rubber molding surface with a gauze pad moistened with water. Wipe cleaned surfaces dry using a clean, dry gauze pad.

2. Canister. Clean, using a cleansing towelette to remove dirt, grime or any other debris from external surfaces or threads. Wipe cleaned surfaces dry using a clean dry gauze pad. Be sure no moisture remains inside canister.

3. 3/4 inch to 3/4 inch coupling, bayonet connector, or quick disconnect fitting. Clean using a gauze pad moistened with water. Wipe cleaned surfaces dry using a clean dry gauze pad.

4-216. INTERCOMMUNICATIONS UNIT.

1. Clean external surface with gauze pad moistened with water.

2. Wipe cleaned surfaces dry using a clean, dry gauze pad.

4-217. CRITERIA AND PROCEDURES FOR REPLACEMENT OF FILTER CANISTERS.

4-218. Only the repairs listed in this section are authorized. All repairs will be conducted at the Organizational or Intermediate Maintenance Level.

4-219. C2 OR C2A1 CANISTER REPLACEMENT. The C2 canister is a standard NATO approved charcoal filter. It is currently being replaced by the C2A1 canister. Either the C2 or C2A1 canister may

be used with the A/P22P-14(V)1 thru (V)4 respirator assemblies. They are designed to remove toxic and/or irritating chemical vapors, gases, and particulate contaminants including biological organisms likely to be used in warfare. Protective capability can be affected by environmental conditions. Hot and humid climates will degrade protection after two months, basic cold climates after twenty-four months, and all other climates after twelve months. Unit NBC officers will provide specific instructions for replacement depending on the unique tactical situation.

WARNING

Only the C2 or C2A1 canister (NIIN 01-119-2315) shall be used as part of the A/P22P-14(V)1 thru (V)4 Respirator Assembly.

Wear protective mask and clothing, in accordance with local standard operating procedures, when replacing or disposing of a canister that has been exposed to a toxic agent.

J-manifold gasket(s) are occasionally displaced from the manifold when the C2 or C2A1 canister is removed. Visual inspection to ensure that the gasket is in place must be performed when canisters are removed or installed.

Filter canisters do not provide protection against ammonia gas or carbon monoxide. Protection against sulfur dioxide gas can be provided for only 5 to 10 minutes.

4-220. Criteria for C2 or C2A1 Replacement. Replace the canisters after any of the following occurrences:

1. Physical damage.

a. Canister is cracked, split, dented on a seam, dented deeper than 1/4-inch, crushed or has holes.

b. Threads are damaged or dented.

c. Lip of threaded neck is dented in excess of 1/32-inch deep.

- d. Body of canister has rust or pitting.
- e. Seams have excessive rust (approximately greater than 10% of seam length).
- 2. Canister has been immersed in water.
- 3. Canister inlets clogged with dirt, oil, grease, or other foreign matter.
- 4. Excessive resistance to airflow or an increase in breathing resistance is felt.
- 5. The lot number of the canister is listed as un-serviceable in SB-3-30-2.
- 6. CB agent contamination.

NOTE

Upon its availability, refer to U.S. Navy/ U.S. Marine Corps Nuclear, Biological & Chemical (NBC) Defense Handbook for detailed procedures for disposition of contaminated canisters. Until its issuance refer to the U.S. Army Field Manual, FM 3-5, NBC Decontamination and the Naval Aviation Nuclear, Biological, and Chemical Defense Resource Manual.

- a. Canisters have been exposed to any agents for any period of time under battlefield conditions during typical missions.
- b. Prior to a mission where CB agents may be employed.
- 7. When directed by unit commander or higher authority.

4-221. Canister Replacement.

- 1. Carefully cut, remove, and discard the 18 inch cable tie securing the pusher fan rubber housing and/or 90° rubber molding to the C2 or C2A1 canister.

- 2. Remove rubber housing and/or 90° rubber molding from canister and retain.
- 3. Unscrew (counterclockwise) canister from the J-manifold.
- 4. Remove and inspect J-manifold gasket

NOTE

Replace with new gasket only if damage or deterioration is evident.

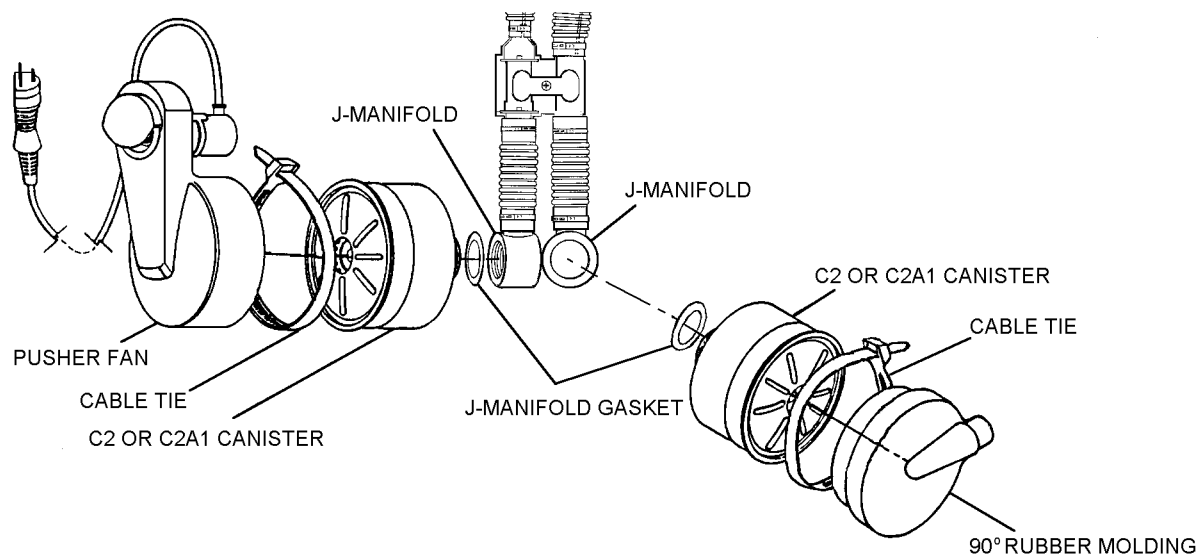
- 5. Clean J-manifold using a gauze pad moistened with isopropyl alcohol and allow to air dry.
- 6. Clean gasket using a gauze pad moistened with distilled water and allow to air dry.
- 7. Reinstall J-manifold gasket ensuring gasket is fully seated and flat. The gasket should be below the threads in the J-manifold canister opening.

NOTE

Ensure canister plug and cap are removed.

- 8. Screw replacement C2 or C2A1 canister clockwise into the J-manifold until hand tight.
- 9. Slide pusher fan rubber housing and/or 90° rubber molding over the C2 or C2A1 canister until the canister lip bottoms against rubber surface. Ensure correct installation as shown in [figures 4-1](#) or [4-2](#), as applicable.
- 10. Using cable tie tool preset to HVY (No. 8) setting, install 18 inch cable tie centered around canister to secure pusher fan rubber housing and/or 90° rubber molding. Ensure connection is tight as explained in [paragraph 4-247](#) or [4-255](#), as applicable.

4-222. Pusher Fan Battery. Plug pusher fan cord into the battery pack. Be careful when inserting plug to avoid breaking off any of the prongs. Ensure plug bottoms out in battery socket.



Steps 1 thru 10 - Para 4-221

4p221s1

4-223. ASSEMBLY.

Materials Required (Cont)

4-224. Instructions for assembling the A/P22P-14(V)1 thru (V)4 Respirator Assemblies are contained in the following paragraphs. Instructions can be followed in sequence for the complete assembly of respirator assemblies, or each step can be done separately as required for that specific part or assembly. To assemble the respirator assembly or any of its components, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Sealing Compound, Type I, White	NIIN 00-877-8972
As Required	Lubricant, KRYTOX, Type II, 240AC	NIIN 00-961-8995
As Required	Cloth, Cotton	—
As Required	Tape, PCV, 1/4 Inch	—
As Required	Thread Locking Compound, Locktite 222	NIIN 01-085-3639

Quantity	Description	Reference Number
As Required	Cable Tie, 4.8 mm	CL 6227
As Required	Cable Tie, 3.6 mm	CL 6226
As Required	Cable Tie, 2.4 mm	CL 6225
As Required	Cable Tie, 7.6 mm, 18 inch	CL 6528
As Required	Sealant, RTV 732	—
As Required	Varnish, Sealing	TBD
1	Applicator Brush	—
As Required	Stepless Low Profile Clamp, 16.5 mm	CL 6592
As Required	Stepless Low Profile Clamp, 21.9 mm	CL 6593
As Required	Stepless Low Profile Clamp, 24.5 mm	CL 6670
As Required	Stepless Low Profile Clamp, 26.5 mm	CL 6594

Support Equipment Required

Quantity	Description	Reference Number
1	Cable Tie Tool, Standard	MS90387-1
1	Cable Tie Tool, Heavy Duty	NIIN 00-937-5438
1	Elastrator	NIIN 01-124-0649
1	Pincer Tool, Low Profile	Oetiker 14100055
	or	
1	Pliers, Hose Clamp	NIIN 01-073-4187
1	Torque Driver	—
1	Square Drive 1/4-Inch	—
1	Torque Driver	—
1	Screwdriver, Slot Head	—
1	Screwdriver, Slot Head	—
1	Nut Driver, 1/8-Inch	—
1	Nut Driver, 3/8-Inch	GGG-W-657

NOTE

All parts must be cleaned in accordance with paragraph 4-192 before assembly can begin.

Refer to paragraph 4-135 for cable tie and stepless low profile clamp installation procedures.

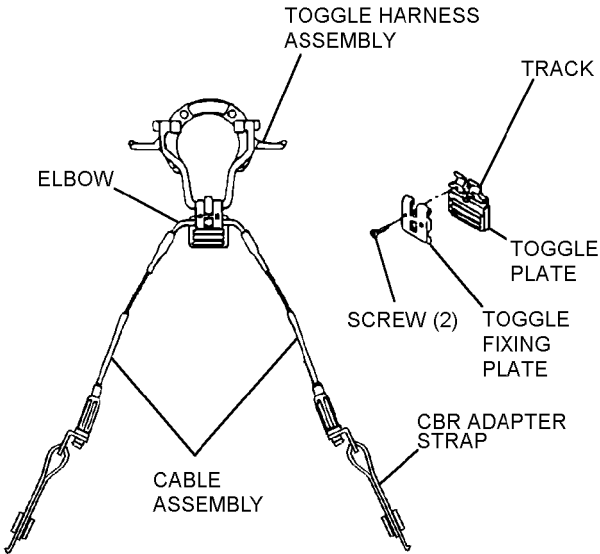
4-225. MASK ASSEMBLY.

NOTE

In order to improve clarity of the illustrations in the following mask assembly instructions, the toggle harness and nose occluder assemblies will appear only in figures addressing these items.

4-226. Toggle Harness Installation.

1. Place the elbow portions of the two cable assemblies into track located on front of toggle plate.
2. Align mask harness assembly with upper lips of toggle plate. Fasten toggle fixing plate to front of toggle plate using two screws.



Steps 1 and 2 - Para 4-226

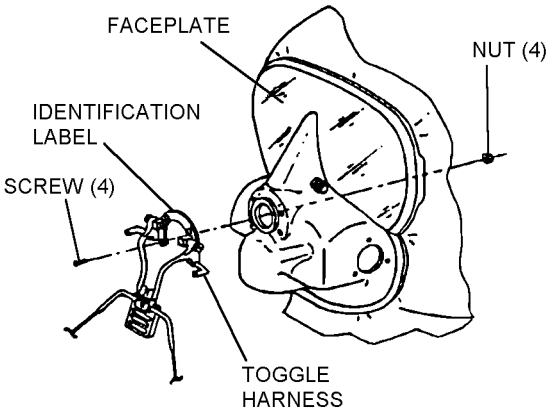
4p226s1

3. Coat countersunk portions of four mounting screws using sealing compound.
4. Fasten toggle harness assembly to faceplate using the four coated screws.



Do not overtighten. Overtightening the screws will crack polycarbonate faceplate.

5. Invert hood, attach and tighten nuts to screws entering faceplate using torque wrench set to 40-42 oz. in.



Steps 3 thru 5 - Para 4-226

4p226s3

4-227. Nose Occluder Installation.

CAUTION

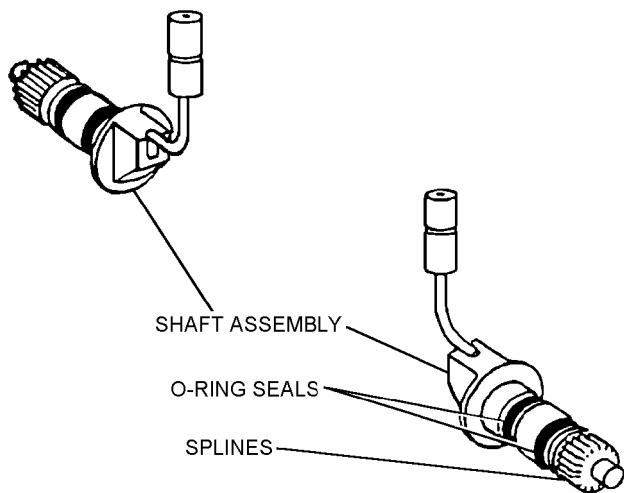
When assembling nose occluder into mask, care should be taken not to force any parts together. Nose occluder and faceplate bushings which are in good working order should fit together snugly but easily. Bushings are black coated brass inserts which are press fitted into the faceplate and sealed with a silicone rubber sealant. Using excessive pressure could dislodge nose occluder faceplate bushings.

NOTE

It is suggested that prior to assembling nose occluder in mask, the shaft assemblies and stirrup be engaged several times to remove any excess coating on splines. If the splines do not engage smoothly after this, they may be out of specification and should be replaced. Use Krytox sparingly to ensure that shaft assembly splines will properly fit into the stirrup splines without excess force. There are no published repair procedures for either spline interference or faceplate bushings at this time.

1. After selecting proper nose occluder kit, before assembling nose occluder to stirrup assembly, apply Krytox lubricant to splined ends of nose occluder shaft assemblies. Work splines of both shaft assemblies in and out of stirrup assembly splines several times until male splines engage smoothly with female splines.

2. Inspect and lightly lubricate two O-ring seals on shaft assemblies.



Steps 1 and 2 - Para 4-227

4p227s1

3. Insert one shaft assembly through inside of faceplate bushing. Position roller portion of assembly flush against inner side of faceplate nose bridge and then engage splines. Repeat for opposite shaft assembly.

4. Position stirrup assembly to be fully down into outer portion of faceplate.

5. Maintain relative positions of shaft assemblies and stirrup, and then ease shaft assemblies through faceplate bushing to engage splines of stirrups.

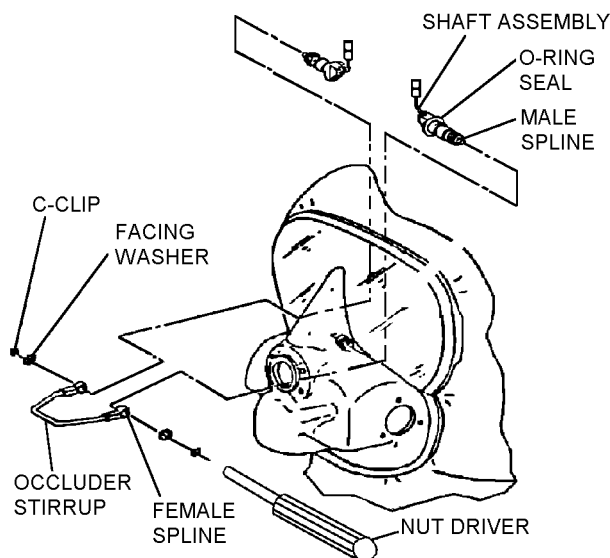
6. Ensure stirrup assembly is in down position. If right handed, use left hand inside of mask to support shaft assembly during C-clip installation, vice versa if left handed.

7. Ensure shaft assembly is completely seated through stirrup end. Place washer on shaft end. Ensure C-clip groove is visible with washer in place.

8. Apply Krytox to end of a 1/8-inch nut driver. Krytox will serve as an installation lubricant and will hold C-clip in place on nut driver.

9. Place C-clip on end of nut driver and adjust C-clip to be centered over nut driver opening.

10. Line up 1/8-inch nut driver directly over center of shaft end and press C-clip into groove. Verify C-clip is properly seated.



Steps 3 thru 10 - Para 4-227

4p227s3

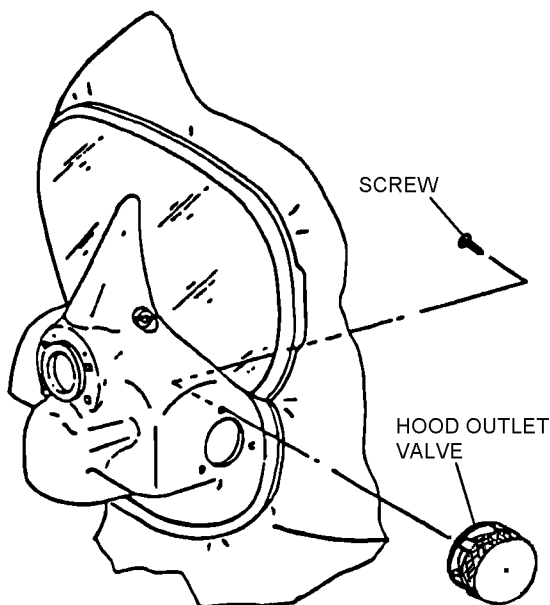
11. Repeat steps 3 through 10 for opposite side.

4-228. Hood Outlet Valve Installation.

1. Coat threaded portions of three securing screws with a thin, even coat of sealing compound.
2. Apply an even film of sealing compound to mating surface of hood outlet valve and to faceplate joint. Place valve over hood outlet port with valve vent positioned to discharge towards rear of hood.

CAUTION

Do not overtighten screws. Overtightening screws will crack polycarbonate faceplate.



Steps 1 and 2 - Para 4-228

4p228s1

3. Install the coated screws to secure the valve into place. Tighten screws with torque screwdriver set to 8-10 oz. in.

4. Remove any excess sealing compound using clean, dry absorbent cloth.

4-229. Hood Inlet Adapter Installation.

1. Invert hood to expose the inner side of the mask.
2. Position a new sealing washer and install hood inlet adapter through faceplate port, taking care to align flat side on adapter flange with molded flat on faceplate port.

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3. Restore hood to its normal position.



Do not overtighten. Overtightening spanner nut will crack polycarbonate faceplate.

4. Install facing washer, then fit the spanner nut. Tighten spanner nut to 14-16 lb. in.

5. Install the hood inlet hose in accordance with paragraph 4-230.

4-230. Hood Inlet Hose Installation.

1. Feed free end of restraint cord through hood inlet hose.
2. Install a 16.5 mm stepless low profile clamp around hood inlet hose cuff.
3. Engage cuff of hood inlet hose over manifold outlet pipe, then hand-seat cuff to fully engage hose on manifold outlet.
4. Using a low profile pincer, secure clamp in place.
5. Insert the loop formed at the free end of the restraint cord into orifice of hood inlet adapter.

6. Fit restraint cord anchor pin through hood inlet adapter, engaging loop of restraint cord and terminating flush with sides of hood inlet adapter.

7. Apply a thin, even coat of sealing varnish to the external surface of stub pipe, taking care not to apply any rubber adhesive to inner surface of hood inlet adapter.

8. Center the loop of restraint cord around anchor pin.

9. Engage cuff of hood inlet hose over stub pipe of hood inlet adapter, then push cuff down for full engagement.

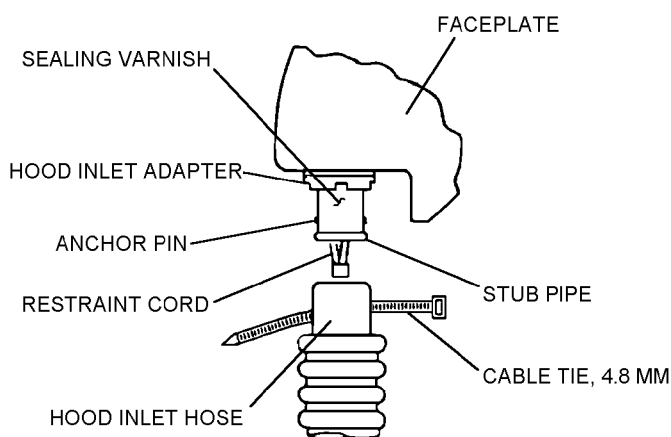
10. Rotate cuff around stub pipe to assure an even spread of sealing varnish over inner surface of the cuff.

11. Remove any excess sealing varnish using clean, dry absorbent cloth.

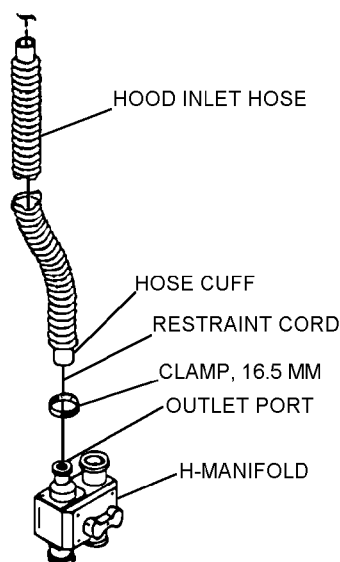
12. Ensure hood inlet hose is straight and free of twists.

13. Position a 4.8 mm cable tie to attach hood inlet hose to hood inlet adapter such that locking head is facing to left rear end of connector.

14. Set cable tie tool (MS90387-1) to its STD (No. 7) setting, then tension cable tie to secure hood inlet hose cuff connection to hood inlet adapter. Remove and discard excess portion of cable tie.



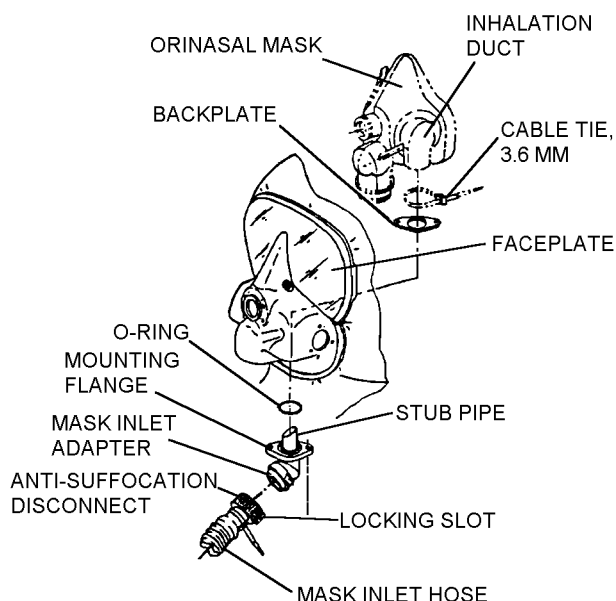
Steps 1 thru 14 - Para 4-230



4p230s1

4-231. Mask Inlet Adapter Installation.

1. Install a new O-ring within mounting flange on mask inlet adapter.
2. Insert mask inlet adapter through faceplate port.
3. Invert hood to expose inside of orinasal mask.
4. Insert backplate over the mask inlet adapter stub pipe, assuring backplate, faceplate, and mounting flange screw holes are aligned.



Steps 1 thru 4 - Para 4-231

5. Return hood to normal position.

6. Apply a thin, even coat of sealing compound to threaded portion of two securing screws.

7. Thread screws through holes in mask inlet adapter mounting flange and faceplate to engage back plate.



Do not overtighten. Overtightening screws will crack polycarbonate faceplate.

8. Ensure sealing O-ring is correctly positioned to seal mask inlet adapter to faceplate, then tighten screws with torque wrench set to 40-42 oz. in.

9. Remove any excess sealing compound using a clean, dry absorbent cloth.

10. If orinasal mask was not removed, proceed with [step 13](#). If orinasal mask was removed, proceed with [step 11](#).

11. Ensure orinasal mask is centered within faceplate, then engage orinasal mask inhalation duct over mask inlet adapter stub pipe; ensure a firm fit.

12. Using a cable tie tool preset to its INT (No. 4) tension setting, secure orinasal mask inhalation duct to mask inlet adapter stub pipe using a 3.6 mm cable tie, with locking head positioned near lower end of inhalation duct. Remove and discard excess portion of cable tie.

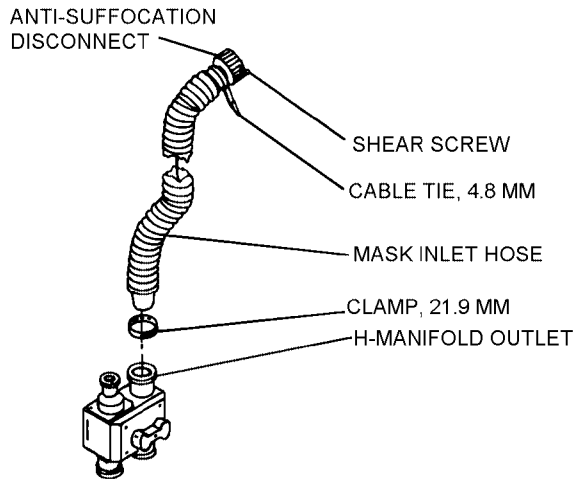
13. Connect anti-suffocation disconnect to mask inlet adapter, taking care to assure mask inlet hose is not twisted.

14. Install shear screw (brass) to lock anti-suffocation disconnect.

4-232. Mask Inlet Hose/Anti-Suffocation Disconnect Installation.

1. Feed free end of restraint cord through mask inlet hose and anti-suffocation disconnect.

2. Using a bowline knot, tie restraint cord to restraint cord pin.
3. Position a 21.9 mm stepless low profile clamp to secure mask inlet hose to manifold outlet.



Steps 1 thru 3 - Para 4-232

4p232s1

4. Apply a thin, even coat of sealing varnish to anti-suffocation disconnect, taking care not to apply any sealing varnish to inner surface.
5. Ease one end of mask inlet hose cuff onto left side H-manifold outlet, and the other cuff onto anti-suffocation disconnect.
6. Rotate mask inlet hose around the anti-suffocation disconnect to ensure an even spread of sealing varnish.
7. Fully seat mask inlet hose connections, then adjust the mask inlet hose to lie without kinks.
8. Using a low profile pincer tool, secure clamp in place.
9. Position a 4.8 mm cable tie to secure mask inlet hose to anti-suffocation disconnect. Position locking head toward the wearer.

10. Install cable tie into place using cable tie tool, preset to the STD (No. 7) tension setting. Remove and discard excess portion of cable tie.

11. Connect anti-suffocation disconnect to mask inlet adapter, taking care to assure mask inlet hose is not twisted.

12. Install shear screw (brass) to lock anti-suffocation disconnect.

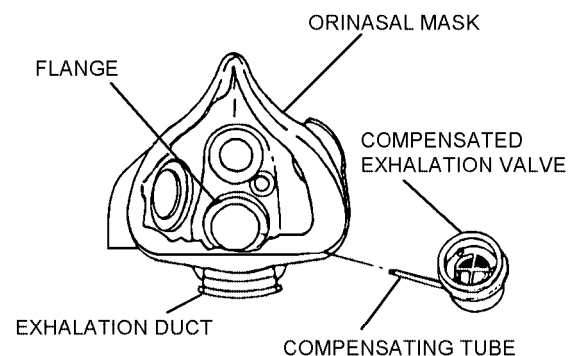
13. Apply a slight clockwise then counterclockwise twist to anti-suffocation disconnect to ensure that the shear screw (brass) has engaged locking slot.

4-233. Compensated Exhalation Valve Installation.

NOTE

A lubricant (KRYTOX, Type II, 240AC) should be provided to aid in this procedure. Ensure no lubricant enters hose opening.

1. Gently work valve's compensating tube into the connective passage between exhalation duct and inhalation duct. Take extreme care not to break or bend compensating tube or puncture rubber of the connective passage.

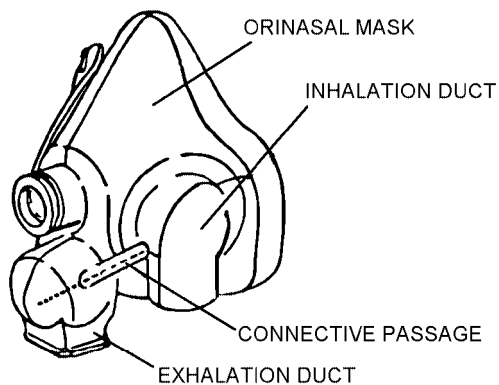


Step 1 - Para 4-233

4p233s1

2. Ensure orifice of compensating tube lies flush with orifice of inhalation duct, and is free of obstruction.

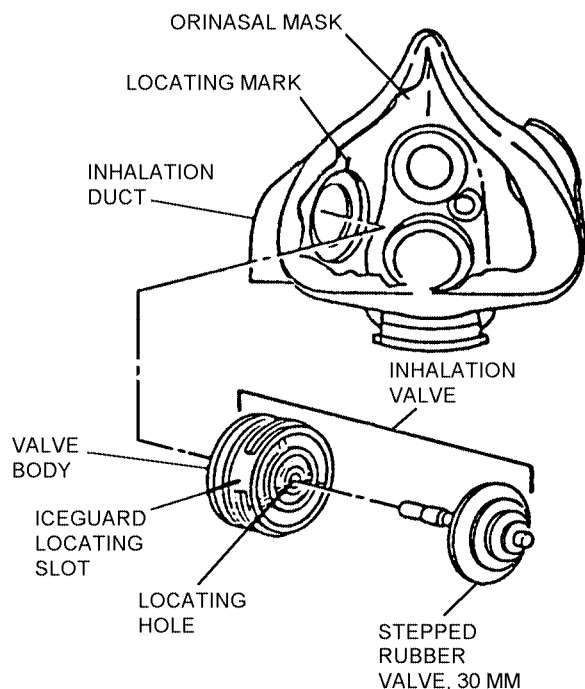
3. Install compensated exhalation valve body into flange of exhalation duct. Ensure valve body is fully engaged within flange.



Steps 2 and 3 - Para 4-233

4p233s2

4-234. Inhalation Valve Installation. Install inhalation valve to flange of orinatal mask inhalation duct, taking care to ensure iceguard locating slots of valve holder are aligned at 90° to molded locating mark on interior of orinatal mask.



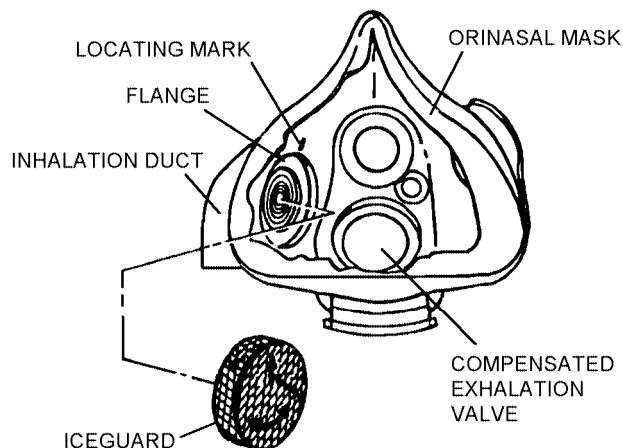
Para 4-234

4p234

4-235. Iceguard Installation.

1. Align arrow engraved on iceguard body with locating mark molded on interior of orinatal mask.

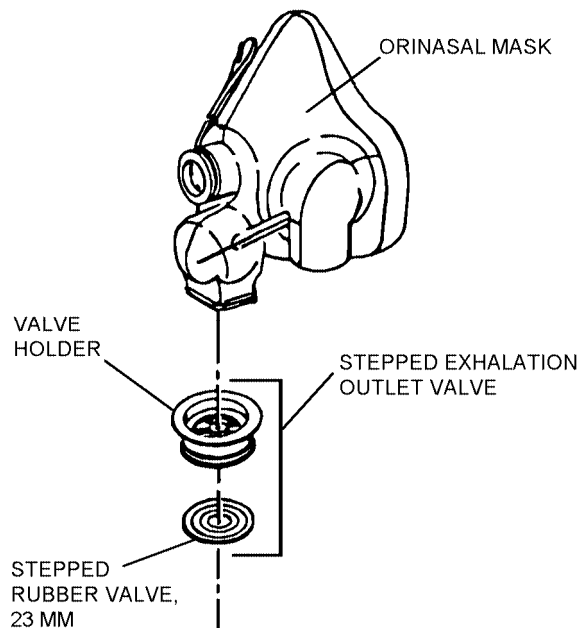
2. Apply a light pressure to iceguard and engage lugs into slots in the inhalation valve holder, then rotate iceguard clockwise 90°. When iceguard is installed correctly, engraved arrow points towards compensated exhalation valve.



Steps 1 and 2 - Para 4-235

4p235s1

4-236. Exhalation Outlet Valve Installation. Using an elastrator, spread mask exhalation duct. Install assembled stepped exhalation outlet valve into orinatal mask exhalation duct, ensuring an even fit of valve holder within duct.



Para 4-236

4p236

4-237. Drink Facility Installation.**NOTE**

Orinasal mask must be removed before installing drink facility.

1. Invert hood to expose orinasal mask, but do not cover faceplate.
2. Place external sealing washer over threaded end of drink tube inlet, orienting it so edges align with edges of drink tube inlet.
3. Insert threaded end of drink tube inlet through faceplate.
4. Install internal sealing (rubber) washer followed by flat (metal) washer, over threaded end of drink tube inlet.



To avoid damaging faceplate, do not over-tighten spacer.

5. Carefully attach threaded spacer onto drink tube inlet so that hexagon-shaped face of spacer is oriented toward inner surface of faceplate. Tighten threaded spacer using a torque wrench set to 8.5 -

9.2 lb. in., while ensuring concave edges of external sealing washer and inlet base fit correctly between raised ridge of microphone orifice and external bulge of orinasal mask cavity.

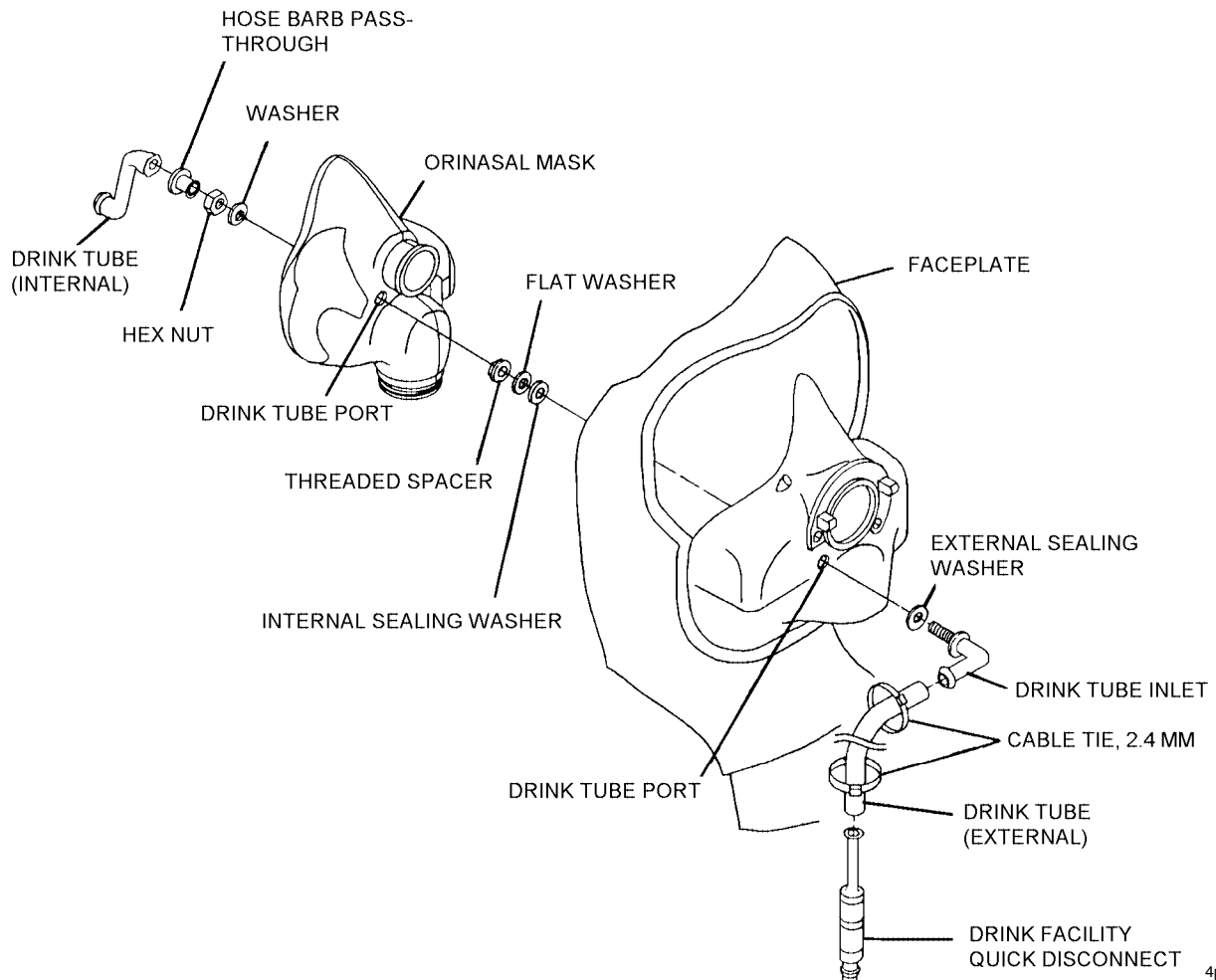
6. Carefully manipulate orinasal mask to insert threaded end of drink tube inlet into hole located immediately above and right of compensated exhalation valve. Ensure microphone cavity extends through faceplate.

7. Place flat (metal) washer over threaded end of drink tube inlet, followed by hex nut. Continue threading hex nut onto inlet until enough threads are exposed to allow threading hose barb onto inlet.

8. Thread hose barb pass through onto drink tube inlet, with the hexagon-shaped face toward hex nut, until it makes contact with hex nut. Align edges so that 3/8-inch nut driver will engage both at the same time.

9. Using the 3/8-inch nut driver, tighten hex nut and hose barb until edge of compensated exhalation valve cavity begins to distort.

10. Place internal drink tube over hose barb, positioning barbed end over compensated exhalation valve.



Steps 1 thru 10 - Para 4-237

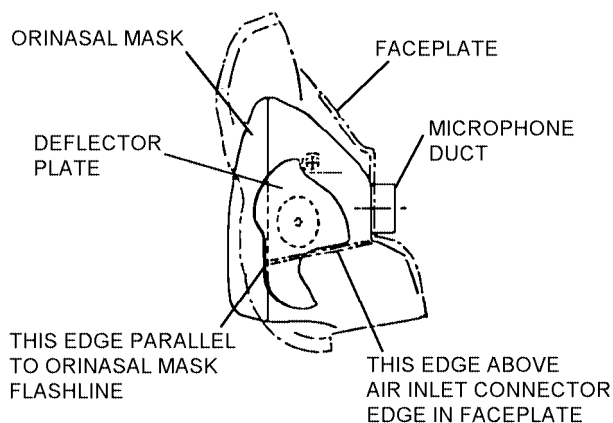
4p237s1

11. Perform mask assembly overall leakage test in accordance with [paragraph 4-149](#) or [4-156](#), as applicable.

4-238. Orinasal Mask Installation.

1. Insert orinasal mask deflector plate into orinasal mask as shown. Lower straight edge of deflector plate should be parallel to edge above air inlet connector ledge in faceplate and should not strike ledge.

2. Ensure proper positioning of deflector plate on orinasal mask.



Steps 1 and 2 - Para 4-238

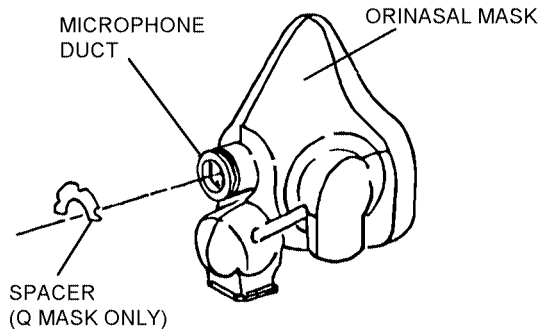
4p238s1

3. Ensure all component parts are installed on orinasal mask in accordance with [paragraphs 4-233 through 4-236](#).



Spacer must be inserted between small orinasal mask microphone duct and inside of faceplate prior to orinasal mask installation.

4. For small-size orinasal mask (Q-designation) only, invert hood and position black spacer inside faceplate. Align notches in spacer with nuts securing the toggle harness assembly to inner surface of faceplate.



Step 4 - Para 4-238

4p238s4

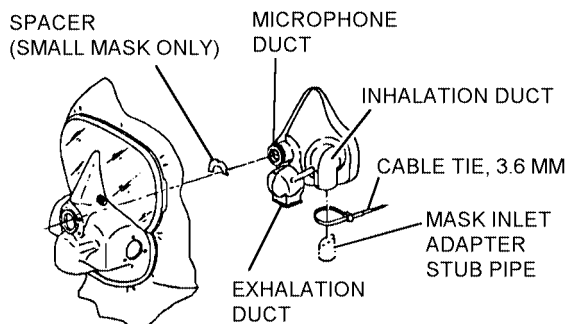
5. With hood remaining inverted, place orinasal mask into faceplate by easing flange of microphone duct and that of exhalation duct through their respective faceplate ports. For small orinasal mask, ensure spacer remains in proper location.

6. Center orinasal mask within faceplate, then engage inhalation duct over mask inlet adapter, ensuring a firm fit. Ensure threaded portion of drink tube assembly passes through grommet in orinasal mask.

7. Clamp inhalation duct to mask inlet adapter using a 3.6 mm cable tie with locking head positioned between the left-hand side of mask inlet and faceplate.

8. Using a cable tie tool preset to its INT (No. 4) tension setting, secure inhalation duct to mask inlet adapter stub pipe. Remove and discard excess portion of the cable tie.

9. If not already done, apply a thin, even coat of thread locking compound to the threaded portion of drink tube assembly, then fit and tighten the locknut using a torque wrench set to 11.5-12.5 in. lb.

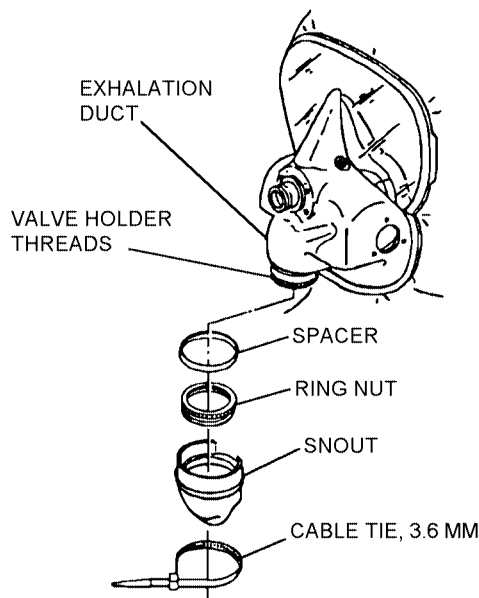


Steps 5 thru 9 - Para 4-238

4p238s5

4-239. Snout Installation.

1. Ease lip of exhalation duct through port of faceplate, ensuring valve is not disturbed within duct, then install spacer.
2. Screw ring nut to threaded portion of valve holder (knurled ring facing up), sealing orinasal mask rubber to faceplate.
3. Install snout over ring nut and position a 3.6 mm cable tie with locking head located to the right of snout. Install with cable tie tool set to INT (No. 4) position. Remove excess portion of cable tie.



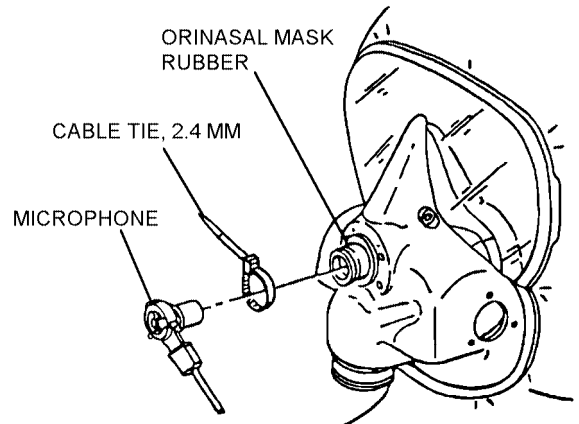
Steps 1 thru 3 - Para 4-239

4p239s1

4-240. Microphone Installation.

1. Push microphone into the orinasal mask rubber duct, taking care not to push orinasal mask rubber back into faceplate port.
2. Position a 2.4 mm cable tie around orinasal mask rubber with locking head of cable tie located to lower right of microphone.
3. Using a cable tie tool preset to INT (No. 4) tension position, clamp orinasal mask rubber to microphone.

4. Remove and discard excess portion of cable tie.

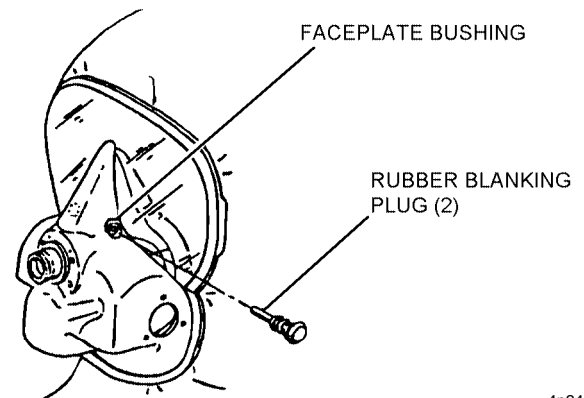


Steps 1 thru 4 - Para 4-240

4p240s1

4-241. Blanking Plug - Nose Occluder Faceplate Bushing.

1. Insert blanking plug in nose occluder bushing from outside of mask.
2. Press blanking plug fully into bushing. Ensure plug rim contacts bushing.



Steps 1 and 2 - Para 4-241

4p241s1

3. Invert hood and ensure lip on end of plug protrudes past end of nose occluder bushing on inner surface of faceplate.

4. Perform Mask Assembly Overall Leakage Test.

4-242. LOWER ASSEMBLY.

4-243. Pusher Fan Subassembly.

4-244. Right Manifold Hose to H-Manifold Assembly (figure 4-104).

1. Install a 24.5 mm stepless low profile clamp over end of manifold hose.

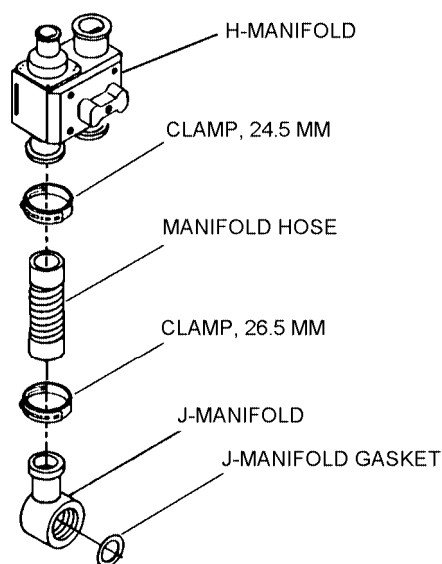


Figure 4-104. Assembling Right Manifold Hose to H-Manifold and J-Manifold

4-104

2. Install 3/4 inch end of Manifold Hose on right-side inlet port of H-manifold.

3. Using a low profile pincer secure, clamp in place around hose approximately 1/4 inch from end of hose. Ensure connection is tight.

4-245. Right Manifold Hose to J-manifold and Gasket Assembly (figure 4-104).

1. Install a 26.5 mm stepless low profile clamp over the 7/8 inch end of Manifold Hose.

2. Insert J-manifold into 7/8 inch (larger) end of hose until hose is flush with manifold shoulder. Ensure J-manifold is positioned with opening as shown in figure 4-1 ((V)1 only) or figure 4-2 ((V)2 through (V)4 only).

3. Using low profile pincer, secure clamp in place around hose approximately 1/2 inch from end of hose. Ensure clamp is below J-manifold retention lip, tight and positioned as shown in paragraph 4-246.

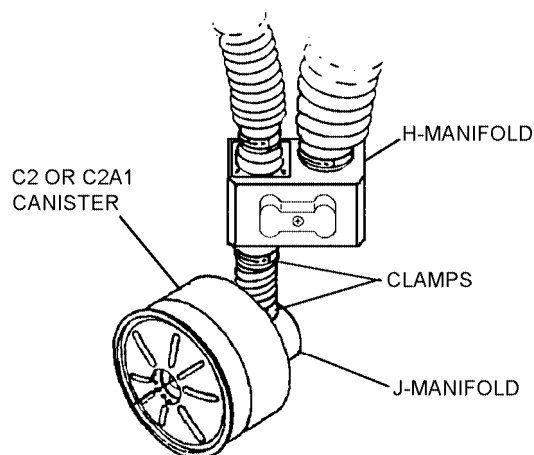
4. Insert J-manifold gasket. Ensure gasket is flat and properly seated.

4-246. C2 or C2A1 Canister Installation.

WARNING

C2 or C2A1 canisters may not be replaced with any other filter canister.

1. Inspect gasket for proper seating in manifold.
2. Screw canister (clockwise) into J-manifold until contact is made with gasket and fully hand tighten.



Step 2 - Para 4-246

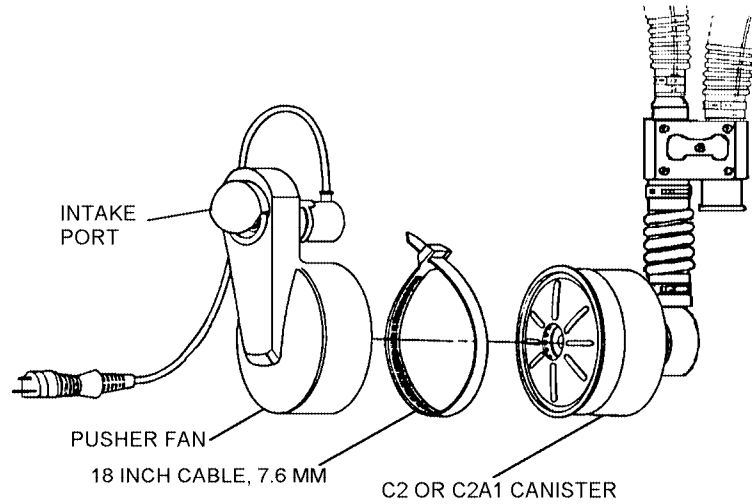
4p246s2

4-247. Pusher Fan Installation.

1. Ensure pusher fan has been tested according to pusher fan bench test, paragraph 4-140.

2. Slide the pusher fan rubber housing over filter canister until canister lip bottoms out in rubber housing. Ensure pusher fan is aligned as shown ((V)2 through (V)4 Respirator Assemblies).

3. Ensure pusher fan intake port is positioned with intake port as shown.



4p247s1

Steps 1 thru 3 - Para 4-247

4. Using the cable tie tool (NIIN 00-937-5438) preset to HVY (No. 8), install the 18 inch cable tie centered around canister to secure the pusher fan rubber housing. Ensure cable tie is tight and positioned properly.

5. Ensure pusher fan is secured properly to C2 or C2A1 canister.

6. Perform Special Inspection in accordance with [paragraph 4-134](#).

7. Document in accordance with OPNAVINST 4790.2 Series.

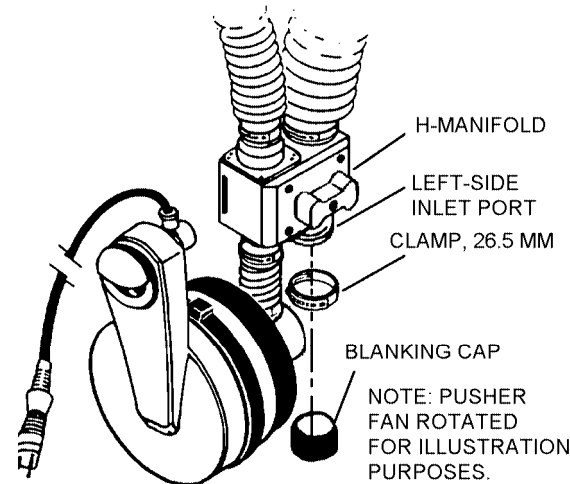
4-248. Pusher Fan Battery Installation. Plug pusher fan cord into the battery pack. Be careful when inserting plug so as not to break off any of the prongs. Be sure plug bottoms out in the battery socket.

4-249. Blanking Cap - (V)1 Only.

4-250. Blanking Cap to H-Manifold Installation.

1. Install blanking cap over left side inlet port of H-manifold.

2. Install 26.5 mm stepless low profile clamp over blanking cap.



4p250s1

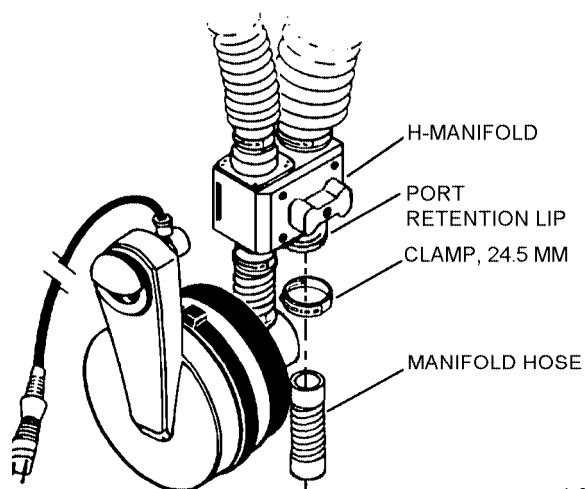
Steps 1 and 2 - Para 4-250

3. Using low profile pincer, secure clamp in place approximately 1/4 inch from bottom of H-manifold body. Ensure clamp connection is tight.

4-251. Oxygen Delivery Subassembly - (V)2 through (V)4 Only.

4-252. Left Manifold Hose to H-Manifold Assembly (3/4 inch - 7/8 inch).

1. Install 24.5 mm stepless low profile clamp over 3/4 inch end of manifold hose.
2. Install 3/4 inch end of Manifold Hose on left-side inlet port of H-manifold.



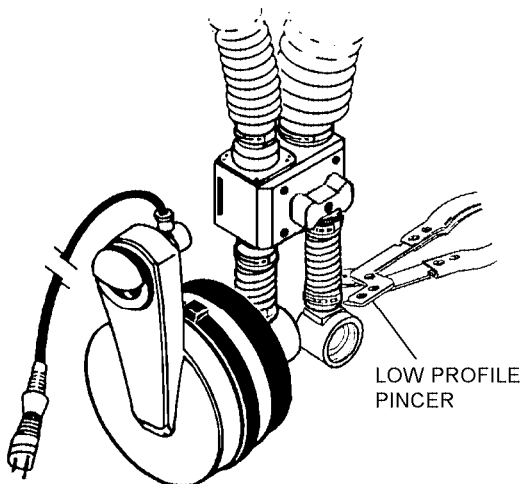
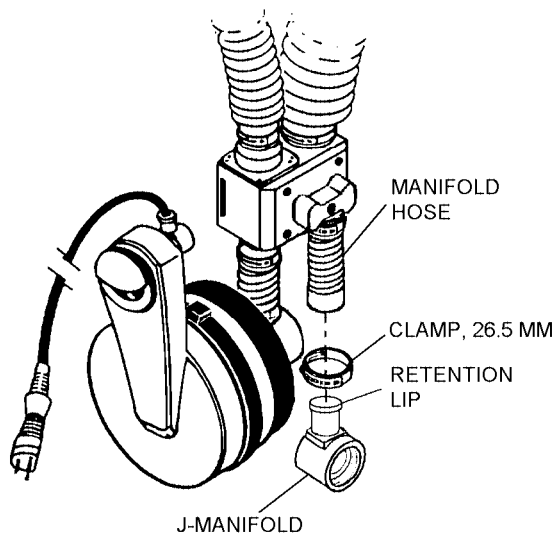
Steps 1 and 2 - Para 4-252

4p252s1

3. Using low profile pincer, secure the clamp in place around hose approximately 1/4 inch from end of hose. Ensure clamp is below port retention lip and tight.

4-253. Left Manifold Hose to J-Manifold Assembly.

1. Install a 26.5 mm stepless low profile clamp over free end of Manifold Hose.
2. Insert the J-manifold into free end of the Manifold Hose until it bottoms out.
3. Slide stepless low profile clamp over the lip of J-manifold until it is about 1/2 inch from end of hose.
4. Ensure all components are aligned as shown.
5. Using low profile pincer, secure clamp in place around hose. Ensure it is below J-manifold retention lip.
6. Insert J-manifold gasket. Ensure gasket is flat and properly seated in groove below threads in canister opening.



Steps 1 thru 5 - Para 4-253

4p253s1

4-254. C2 or C2A1 Canister Installation.

WARNING

C2 or C2A1 canisters may not be replaced with any other filter canister.

1. Inspect gasket for proper seating in manifold.
2. Screw canister (clockwise) into J-manifold until contact with gasket and fully hand tighten.

4-255. 90° Rubber Molding Installation.

1. Slide 90° rubber molding over the canister until the outer canister lip is fully seated in groove inside 90° rubber molding.

WARNING

Failure to seat rubber molding properly may result in restricted oxygen flow to the

user, i.e., do not push rubber molding past lip groove connection.

NOTE

Rubber molding will rotate easily on groove when seated properly.

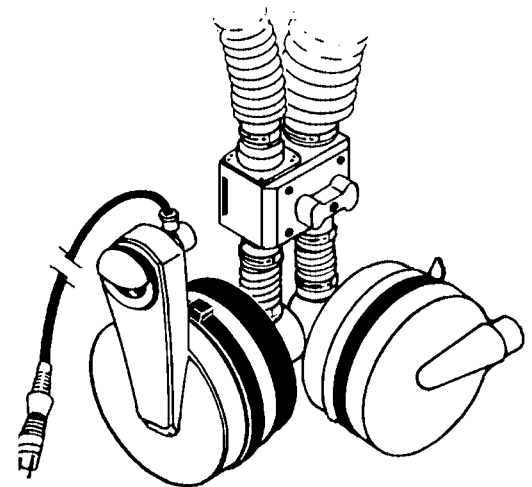
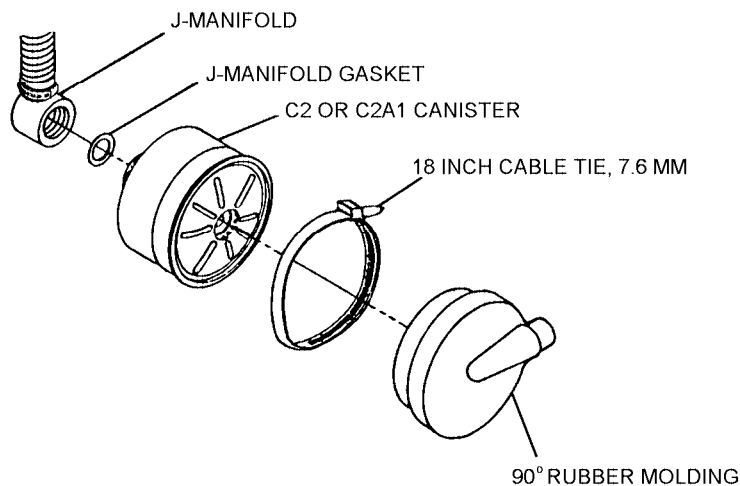
2. Rotate rubber molding clockwise until molding inlet is facing directly to right of Manifold Hose approximately 90°.

3. Using cable tie tool preset to HVY (No. 8), install cable tie centered around canister between the boot apron groove and boot apron lip, to secure 90° rubber molding. Ensure cable tie connection is tight and positioned as shown in [figures 4-2 to 4-4](#).

4. Ensure boot is properly seated on canister.

4-256. LOX ((V)2 Variant) Delivery System Assembly.

1. Install a 24.5 mm stepless low profile clamp over the end of the 90° rubber molding.



Steps 1 thru 3 - Para 4-255

4p255s1

NAVAIR 13-1-6.10

2. Install 3/4 inch to 3/4 inch coupling into 90° rubber molding inlet until flush.

3. Using the low profile pincer, secure clamp in place approximately 1/4 inch from end of 90° rubber molding inlet. Ensure clamp connection is tight.

4. Install free end of coupling into end of 3/4 inch - 3/4 inch ID regulator hose.

5. Install a 24.5 mm stepless low profile clamp over free end of hose.

6. Using the low profile pincer, secure clamp in place around regulator hose approximately 1/4 inch from end of hose. Ensure clamp connection is tight.

7. Install a 24.5 mm stepless low profile clamp over free end of the regulator hose.

8. Connect the regulator hose to the LOX regulator outlet port and position regulator as shown.

9. Using the low profile pincer, secure clamp in place around regulator hose approximately 1/4 inch

from end of hose. Ensure clamp connection is tight and positioned properly.

10. LOX regulator assembly.

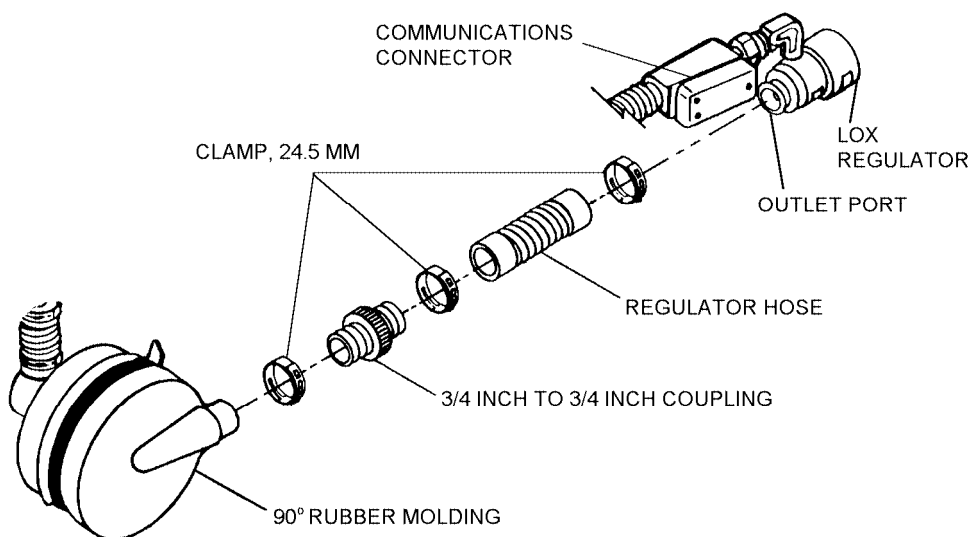
a. Tape the pipe threads of the lox regulator hose with two turns of teflon tape and screw the hose finger tight into the LOX regulator.

b. Position LOX regulator and regulator seat kit hose assembly so that the aircraft communication connector is seated on top of the LOX regulator and in line with 90° elbow.

c. Attach wrench and tighten one to two turns maximum, while maintaining the location of the communications receiver, as detailed above.

4-257. OBOGS ((V)3 Variant) Delivery System Assembly.

1. Install a 24.5 mm stepless low profile clamp over the end of the 90° rubber molding.



Steps 1 thru 9 - Para 4-256

4p256s1

2. Position connector so that it will allow OBOGS regulator to be aligned as shown.

3. Install connector into 90° rubber molding inlet until flush.

4. Using low profile pincer, secure clamp in place approximately 1/4 inch from end of 90° rubber molding inlet. Ensure clamp connection is tight.

5. OBOGS regulator assembly.

a. Tape pipe threads of OBOGS regulator hose with two turns of teflon tape and screw hose finger tight into OBOGS regulator.

b. Position OBOGS regulator and regulator seat kit hose assembly so that aircraft communications connector is seated on top of OBOGS regulator and in line with the 90° elbow.

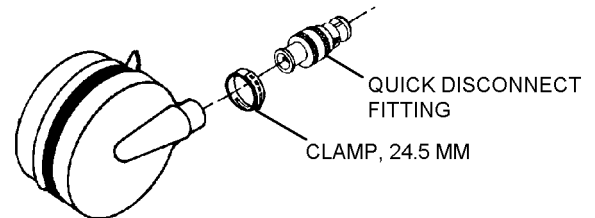
c. Attach wrench and tighten one to two turns maximum, while maintaining location of communications connector, as detailed above.

4-258. Panel Mounted ((V)4 Variant) Delivery System Assembly.

1. Install a 24.5 mm stepless low profile clamp over end of rubber molding.

2. Install quick disconnect fitting into 90° rubber molding inlet until flush.

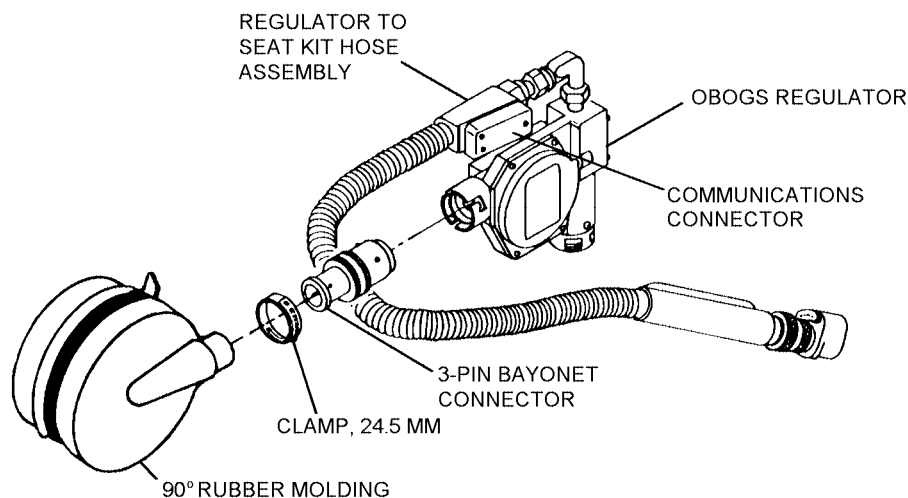
3. Using low profile pincer, secure clamp in place approximately 1/4 inch from end of 90° rubber molding inlet. Ensure clamp connection is tight.



Steps 1 thru 3 - Para 4-258

4p258s1

4. Peel away protective coating, if applied, to faceplate visual area.



Steps 1 thru 4 - Para 4-257

4p257s1

Section 4-5. Illustrated Parts Breakdown

4-259. GENERAL.

4-260. This section lists and illustrates only replaceable components of the respirator assemblies. The IPB is intended for use in identification, procurement and the issuance of replacement components. It also illustrates the necessary disassembly and assembly relationships. Installation, operation, and maintenance of the respirator assemblies shall be performed only by authorized personnel using the instructions set forth in the preceding sections. Source, Maintenance and Recoverability codes are provided for procurable items.

CAUTION

Only parts listed in the IPB are authorized to be procured at this time.

NOTE

For more complete information on the IPB, Group Assembly Parts List and SM&R Codes, refer to [Chapter 2, Section 2-4](#), [NAVSUPINST 4423.29](#), [OPNAVINST 4410.2A](#), and [NAVSUP P-719](#).

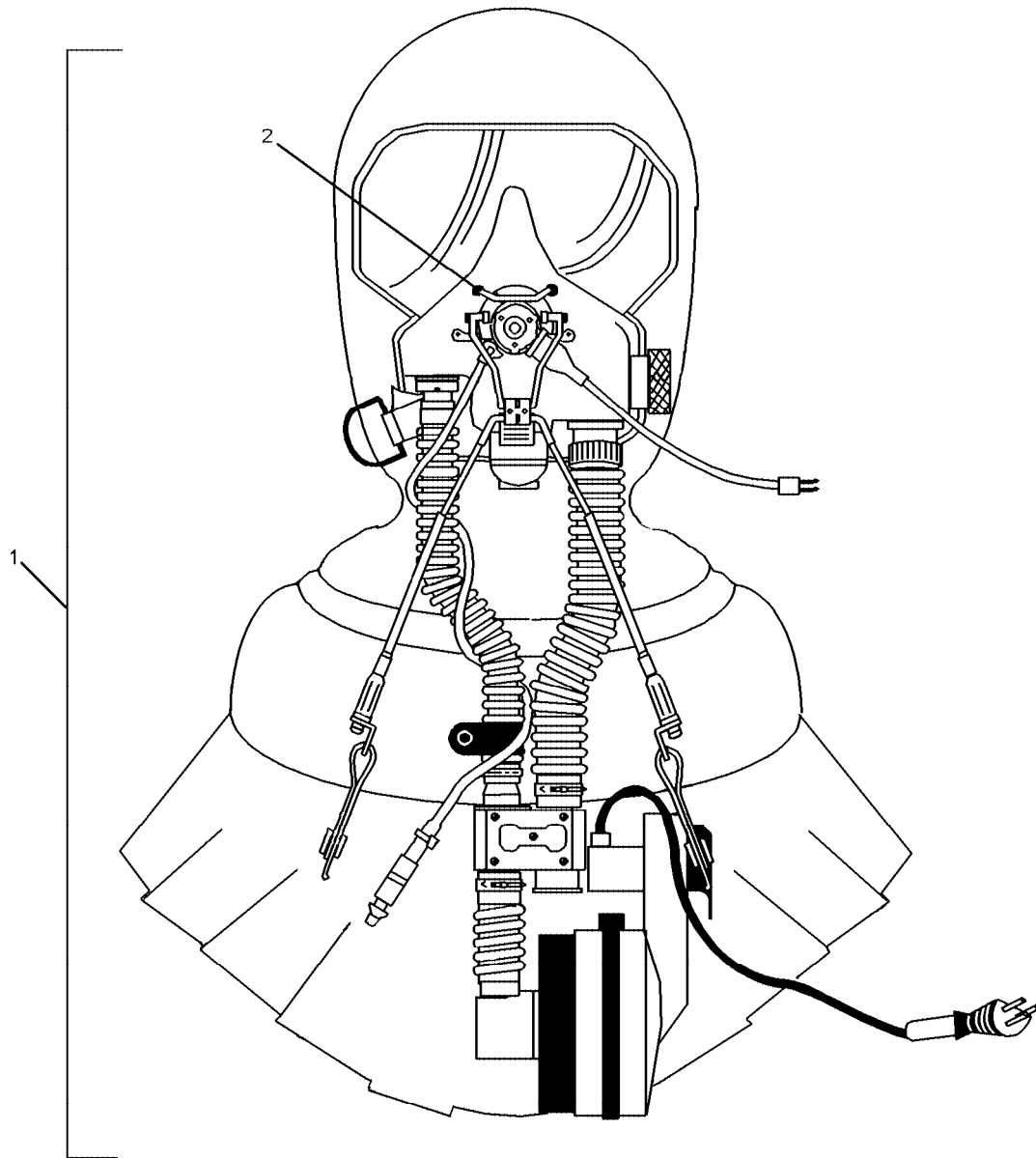


Figure 4-105. A/P22P-14(V) Series Respirator Assemblies (Nose Occluder Identified)

4-105

NAVAIR 13-1-6.10

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
4-105-1	—	RESPIRATOR ASSEMBLY, A/P22P-14(V) (FIGURE 4-106 FOR BREAKDOWN)	REF	
-2	CL 6564	OCCLUDER ASSEMBLY, NOSE 4mm LONG	1	
	CL 6565	OCCLUDER ASSEMBLY, NOSE 5mm LONG	1	
	CL 6566	OCCLUDER ASSEMBLY, NOSE 6mm LONG	1	
	CL 6567	OCCLUDER ASSEMBLY, NOSE 7mm LONG	1	
	CL 6568	OCCLUDER ASSEMBLY, NOSE 4mm SHORT	1	
	CL 6569	OCCLUDER ASSEMBLY, NOSE 5mm SHORT	1	
	CL 6570	OCCLUDER ASSEMBLY, NOSE 6mm SHORT	1	
	CL 6571	OCCLUDER ASSEMBLY, NOSE 7mm SHORT (FIGURE 4-107 FOR BREAKDOWN)	1	

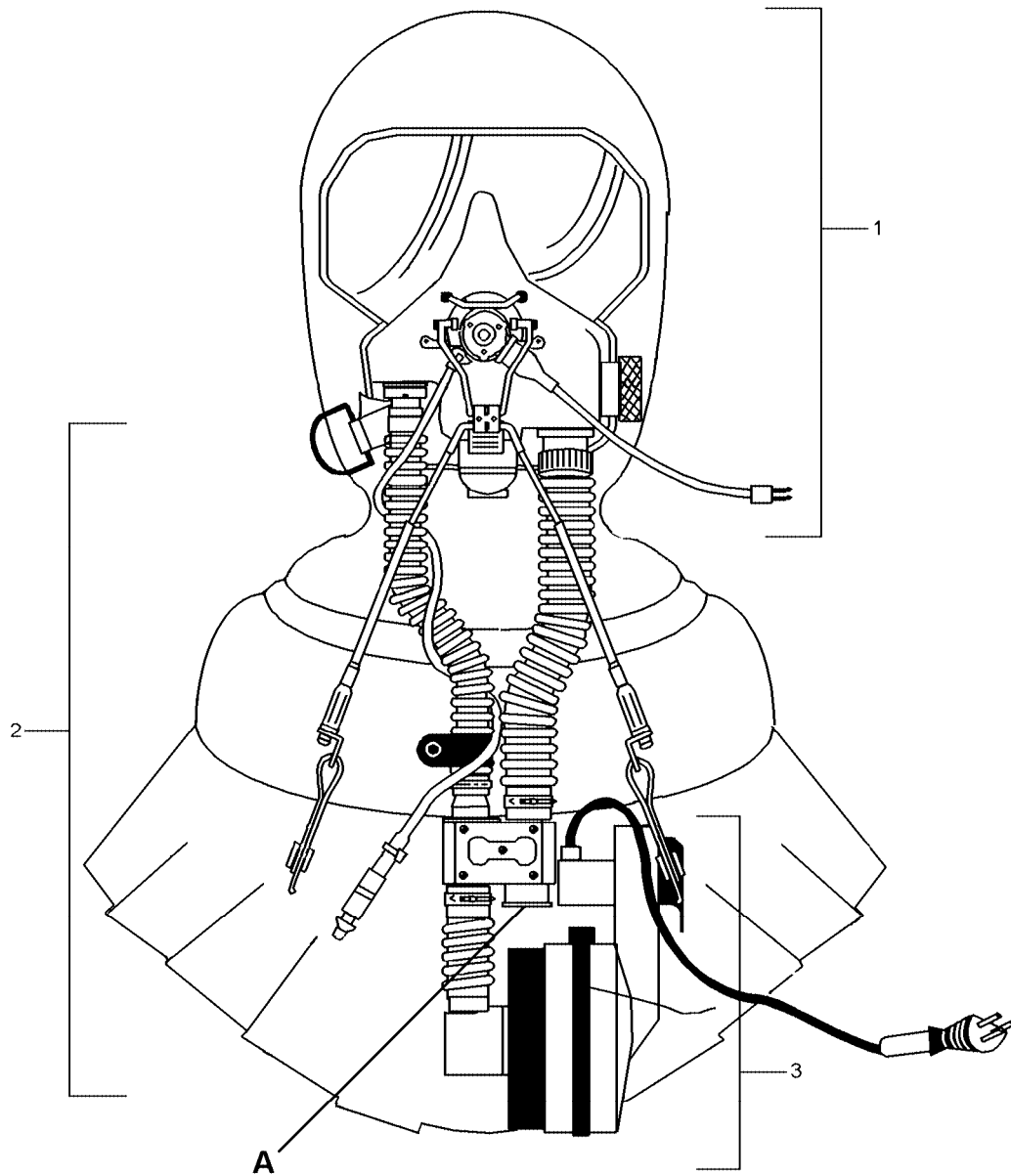


Figure 4-106. A/P22P-14(V) Series Respirator Assemblies
(Major Components Identified) (Sheet 1 of 2)

4-106-1

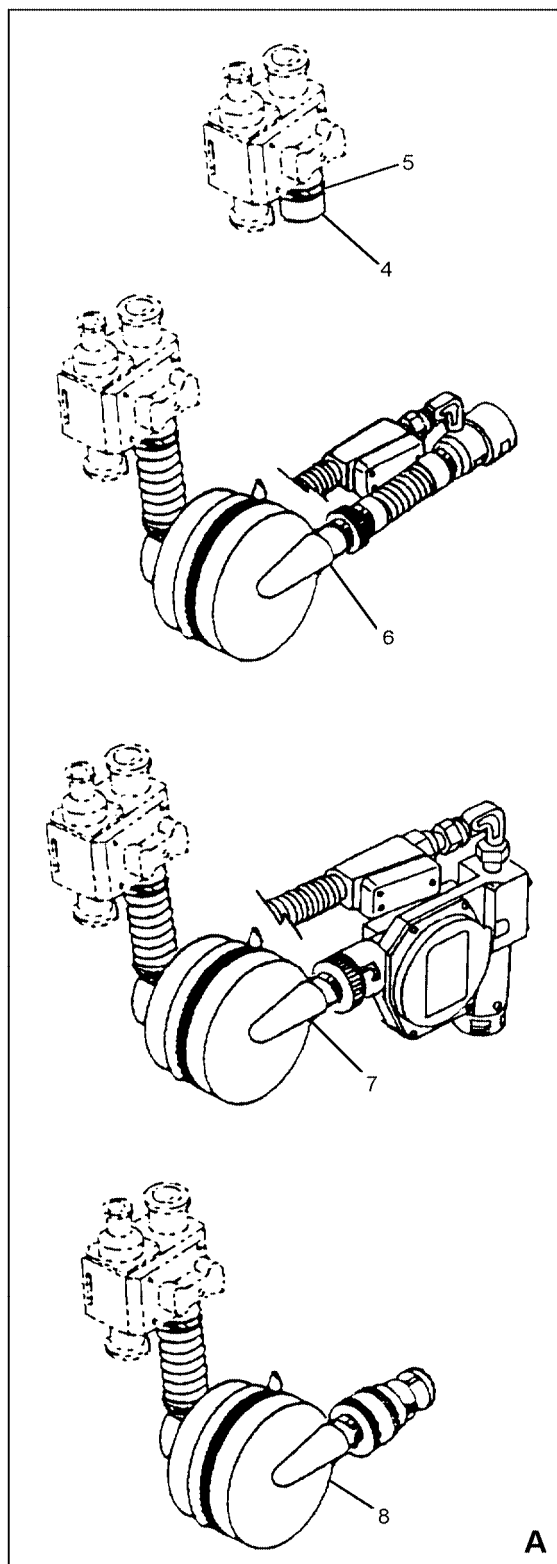


Figure 4-106. A/P22P-14(V) Series Respirator Assemblies
(Major Components Identified) (Sheet 2 of 2)

4-106-2

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
4-106	—	RESPIRATOR ASSEMBLY, A/P22P-14(V) SERIES							REF	
-1	—	. MASK ASSEMBLY (FIGURE 4-108 FOR BREAKDOWN)							1	
-2	—	. LOWER ASSEMBLY ((V)1 VARIANT) (FIGURE 4-120 FOR BREAKDOWN)							1	
	—	. LOWER ASSEMBLY ((V)2 - (V)4 VARIANTS) . (FIGURE 4-121 FOR BREAKDOWN)							1	
-3	—	. PUSHER FAN SUBASSEMBLY (FIGURE 4-122 FOR BREAKDOWN)							1	
-4	CL 6585	. BLANKING CAP ((V)1 ONLY) (FIGURE 4-123 FOR BREAKDOWN)							1	
-5	CL 6594	. STEPLESS LOW PROFILE CLAMP, 26.5 MM .. (FIGURE 4-123 FOR BREAKDOWN)							1	
-6	—	. LOX SUBASSEMBLY ((V)2 ONLY) (FIGURE 4-123 FOR BREAKDOWN)							1	
-7	—	. OBOGS SUBASSEMBLY ((V)3 ONLY) (FIGURE 4-123 FOR BREAKDOWN)							1	
-8	—	. PANEL MOUNTED SUBASSEMBLY ((V)4 ONLY) (FIGURE 4-123 FOR BREAKDOWN)							1	

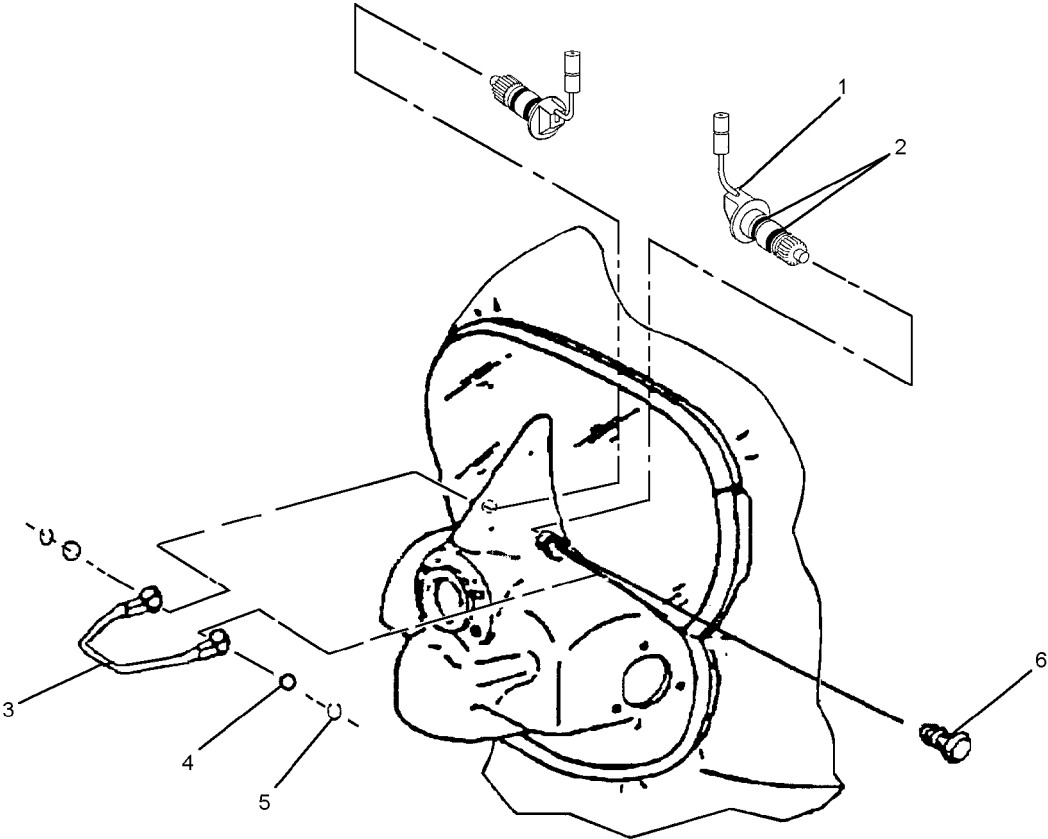


Figure 4-107. Nose Occluder Assembly

004107

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
4-107	CL 6564	OCCLUDER ASSEMBLY, NOSE 4mm LONG	1	
	CL 6565	OCCLUDER ASSEMBLY, NOSE 5mm LONG	1	
	CL 6566	OCCLUDER ASSEMBLY, NOSE 6mm LONG	1	
	CL 6567	OCCLUDER ASSEMBLY, NOSE 7mm LONG	1	
	CL 6568	OCCLUDER ASSEMBLY, NOSE 4mm SHORT	1	
	CL 6569	OCCLUDER ASSEMBLY, NOSE 5mm SHORT	1	
	CL 6570	OCCLUDER ASSEMBLY, NOSE 6mm SHORT	1	
	CL 6571	OCCLUDER ASSEMBLY, NOSE 7mm SHORT	1	
	-1	. SHAFT ASSEMBLY	2	
	-2	. . O-RING	2	
	-3	. STIRRUP	1	
	-4	. WASHER, FACING	2	
	-5	. □ C-CLIP (Note 2) □	2	
	-6	CL 6131 PLUG, BLANKING (Note 1) □ □	2	
Notes:		1. Blanking plugs are to be installed when nose occluder is not installed.		
		2. For substitute/replacement C-clip, order P/N 67152728 (MSC Industrial Supply Co., Phone: 1-800-645-7270).		

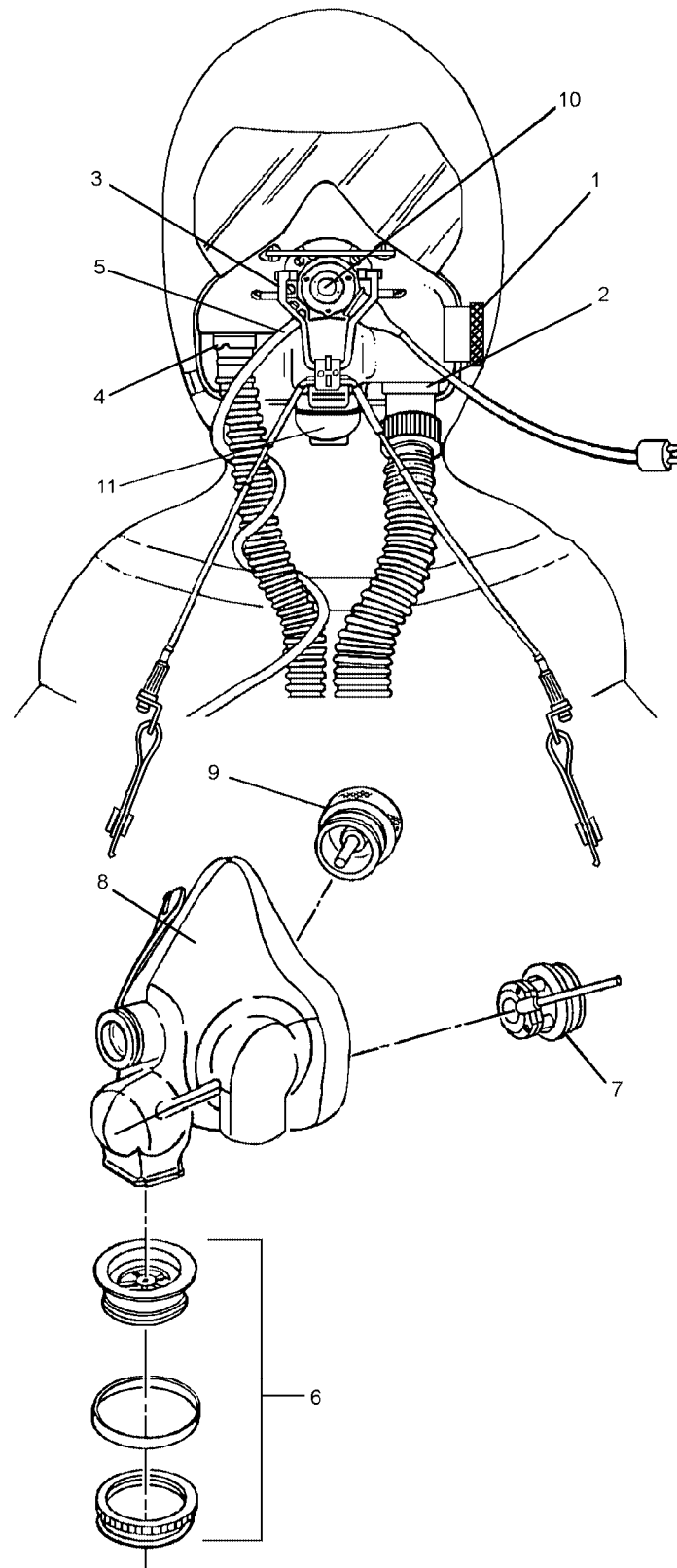


Figure 4-108. Mask Assembly

4-108

NAVAIR 13-1-6.10

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
4-108	—	MASK ASSEMBLY							REF	
-1	—	. HOOD OUTLET VALVE ASSEMBLY (FIGURE 4-109 FOR BREAKDOWN)							1	
-2	—	. MASK INLET ADAPTER ASSEMBLY (FIGURE 4-110 FOR BREAKDOWN)							1	
-3	—	. TOGGLE HARNESS ASSEMBLY (FIGURE 4-111 FOR BREAKDOWN)							1	
-4	—	. HOOD INLET ADAPTER ASSEMBLY (FIGURE 4-112 FOR BREAKDOWN)							1	
-5	—	. DRINK FACILITY ASSEMBLY (FIGURE 4-113 FOR BREAKDOWN)							1	
-6	—	. EXHALATION OUTLET VALVE ASSEMBLY (FIGURE 4-114 FOR BREAKDOWN)							1	
-7	—	. COMPENSATED EXHALATION VALVE ASSEMBLY (FIGURE 4-115 FOR BREAKDOWN)							1	
-8	—	. ORINASAL MASK ASSEMBLY (FIGURE 4-116 FOR BREAKDOWN)							1	
-9	—	. INHALATION VALVE ASSEMBLY (FIGURE 4-117 FOR BREAKDOWN)							1	
-10	—	. MICROPHONE ASSEMBLY (FIGURE 4-118 FOR BREAKDOWN)							1	
-11	—	. SNOUT ASSEMBLY (FIGURE 4-119 FOR BREAKDOWN)							1	

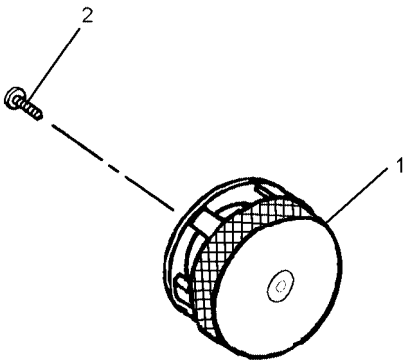


Figure 4-109. Hood Outlet Valve Assembly

4-109

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
4-109	—	HOOD OUTLET VALVE ASSEMBLY							REF	
-1	CL 6357	. VALVE, HOOD OUTLET							1	
-2	—	. SCREW, PANHEAD							3	

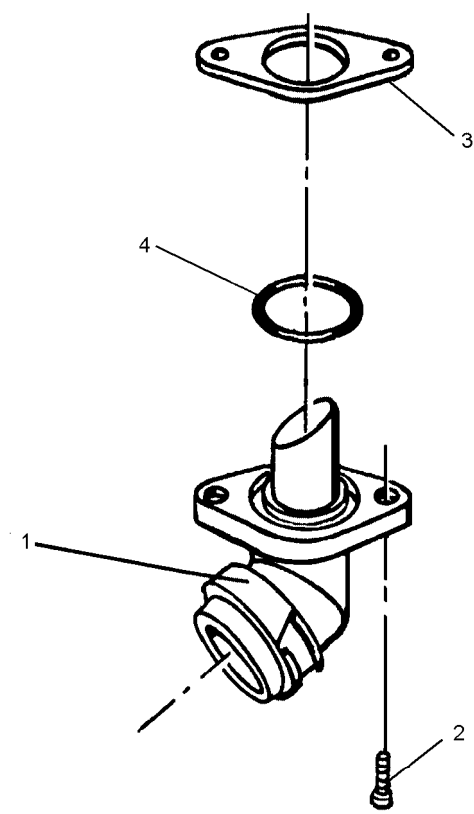


Figure 4-110. Mask Inlet Adapter Assembly

4-110

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
4-110	—	MASK INLET ADAPTER ASSEMBLY	REF	
-1	—	. ADAPTER, MASK INLET	1	
-2	—	. SCREW, PANHEAD	2	
-3	—	. BACKPLATE	1	
-4	—	. O-RING	1	

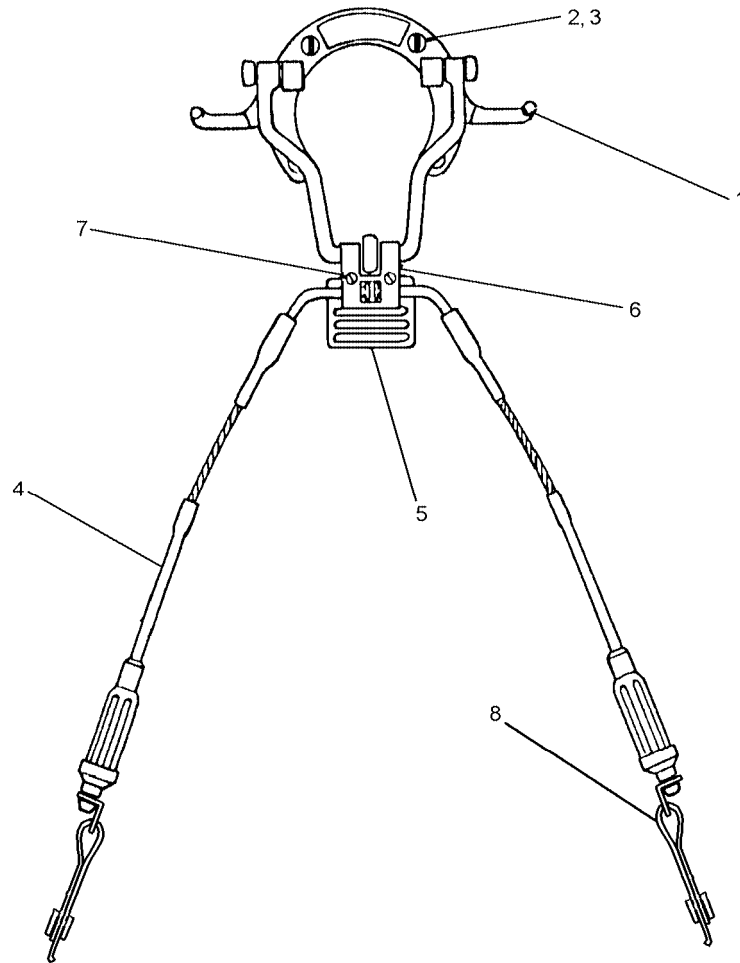


Figure 4-111. Toggle Harness Assembly

4-111

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
4-111	—	TOGGLE HARNESS ASSEMBLY							REF	
-1	—	. HARNESS, MASK							1	
-2	—	. . SCREW, COUNTERSUNK							4	
-3	—	. . NUT							4	
-4	—	. CABLE ASSEMBLY							2	
	—	. TOGGLE PLATE KIT							1	
-5	—	. . PLATE, TOGGLE (NOTE 1)							1	
-6	—	. . PLATE, FIXING (NOTE 1)							1	
-7	—	. . SCREW (NOTE 1)							2	
-8	—	. STRAP, ADAPTER							2	
Notes:		1. Supplied in Toggle Plate Kit.								

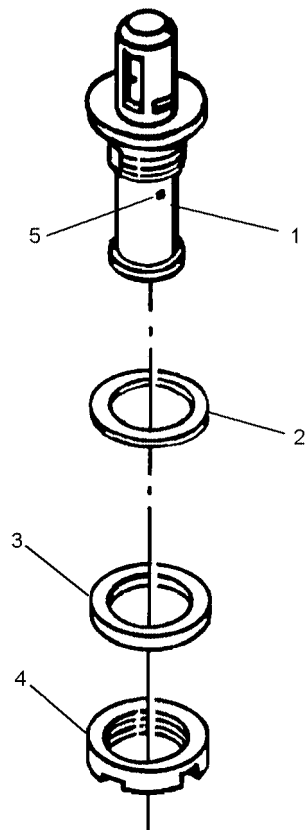


Figure 4-112. Hood Inlet Adapter Assembly

4-112

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
4-112	—	HOOD INLET ADAPTER ASSEMBLY							REF	
-1	—	. ADAPTER, HOOD INLET							1	
-2	—	. . WASHER SEALING							1	
-3	—	. . WASHER FACING							1	
-4	—	. . NUT							1	
-5	—	. . PIN, CORD RESTRAINING							1	

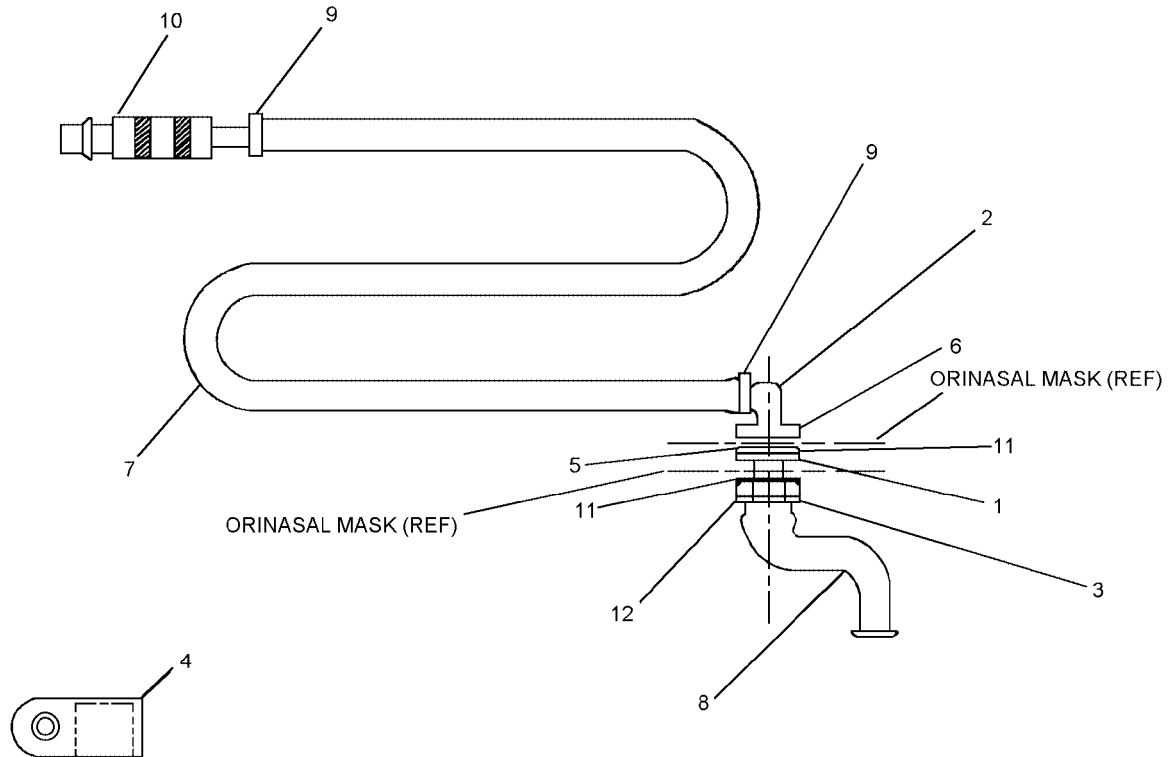


Figure 4-113. Drink Facility Assembly

4-113

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
4-113	—	DRINK FACILITY ASSEMBLY							REF	
-1	—	. SPACER							1	
-2	—	. DRINK TUBE, INLET							1	
-3	—	. HOSE BARB, DRINK TUBE, PASS THRU							1	
-4	—	. DRINK TUBE FACILITY HOLDER							1	
-5	—	. WASHER, INTERNAL SEALING							1	
-6	—	. WASHER, EXTERNAL SEALING							1	
-7	CL 6489	. DRINK TUBE, EXTERNAL							1	
-8	CL 6490	. DRINK TUBE, INTERNAL							1	
-9	CL 6225	. CABLE TIE, 2.4 MM							2	
-10	CL 6439	. DRINK FACILITY, QUICK DISCONNECT							1	
-11	—	. WASHER, FLAT							2	
-12	—	. NUT, PLAIN, HEXAGON							1	

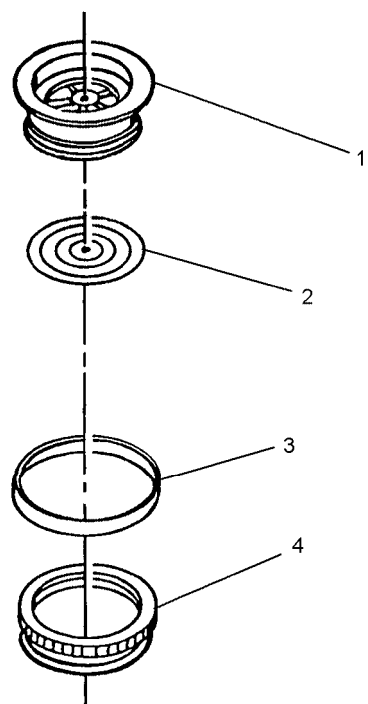


Figure 4-114. Exhalation Outlet Valve Assembly

4-114

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
4-114	—	EXHALATION OUTLET VALVE ASSEMBLY							REF	
-1	—	. VALVE BODY, EXHALATION OUTLET							1	
-2	CL 6383	. STEPPED RUBBER VALVE							1	
-3	—	. SPACER RING							1	
-4	—	. LOCKING RING							1	

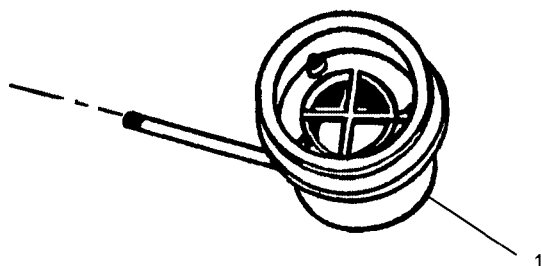


Figure 4-115. Compensated Exhalation Valve Assembly

4-115

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
4-115	—	COMPENSATED EXHALATION VALVE							REF	
-1	—	. VALVE, COMPENSATED EXHALATION							1	

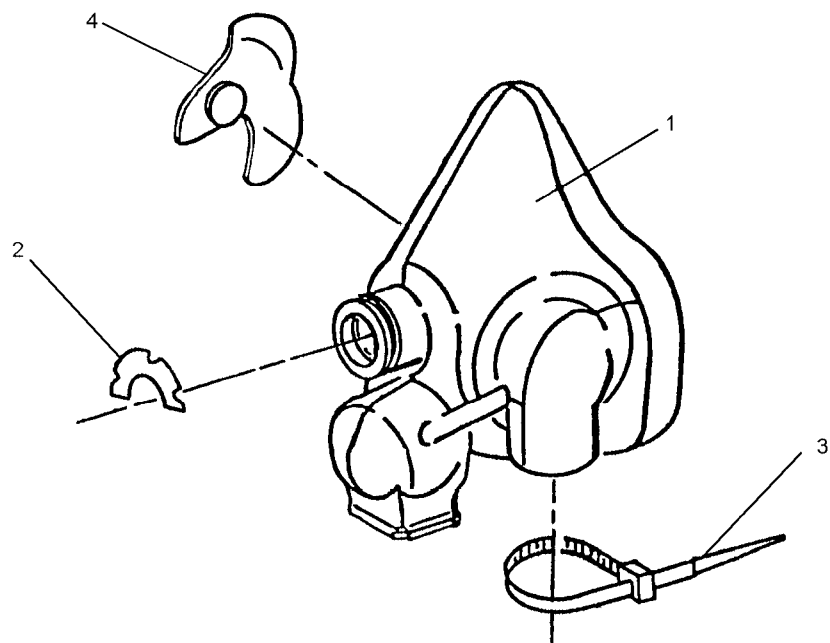


Figure 4-116. Orinasal Mask Assembly

4-116

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
4-116	—	ORINASAL MASK ASSEMBLY	REF	
-1	—	. MASK ORINASAL (LARGE (P) OR SMALL (Q))	1	
-2	—	. SPACER	1	
-3	CL 6226	. CABLE TIE, 3.6 MM	1	
-4	—	. PLATE, MASK DEFLECTOR	1	

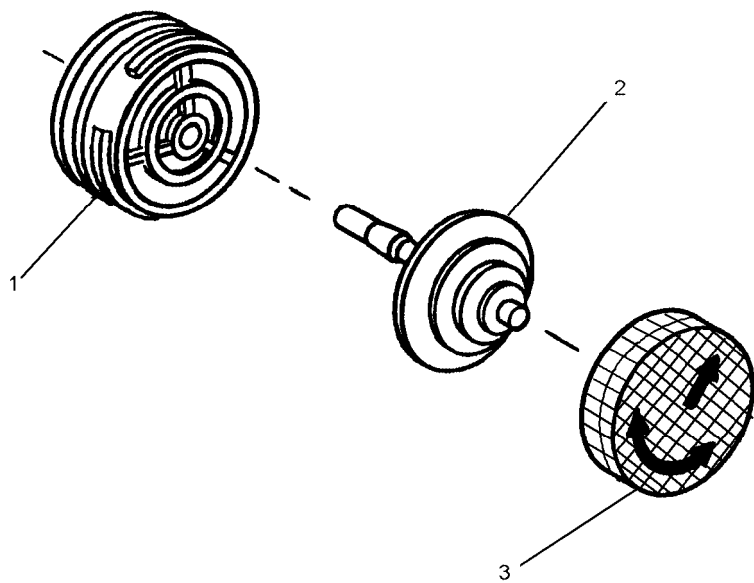


Figure 4-117. Inhalation Valve Assembly

4-117

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
4-117	—	INHALATION VALVE ASSEMBLY							REF	
-1	—	. VALVE BODY, INHALATION							1	
-2	CL 6297	. VALVE, STEPPED RUBBER, 30 MM							1	
-3	OP 17652	. ICEGUARD							1	

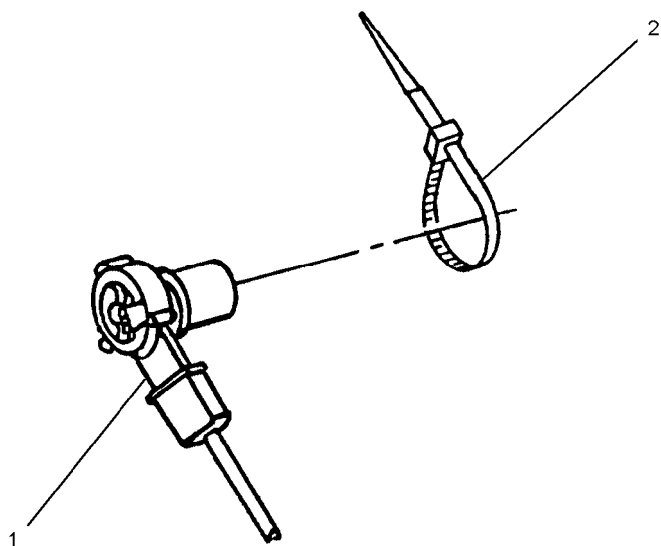


Figure 4-118. Microphone Assembly

4-118

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
4-118	—	MICROPHONE ASSEMBLY							REF	
-1	CL 6605	. MICROPHONE							1	
-2	CL 6225	. CABLE TIE, 2.4 MM							1	

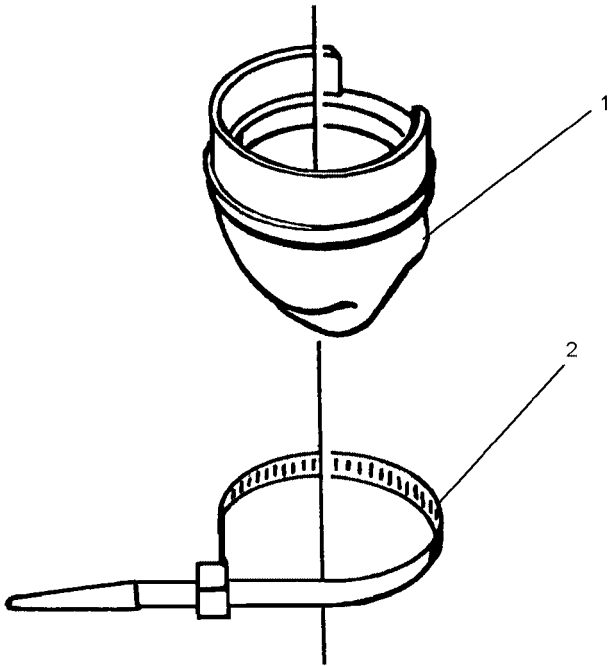
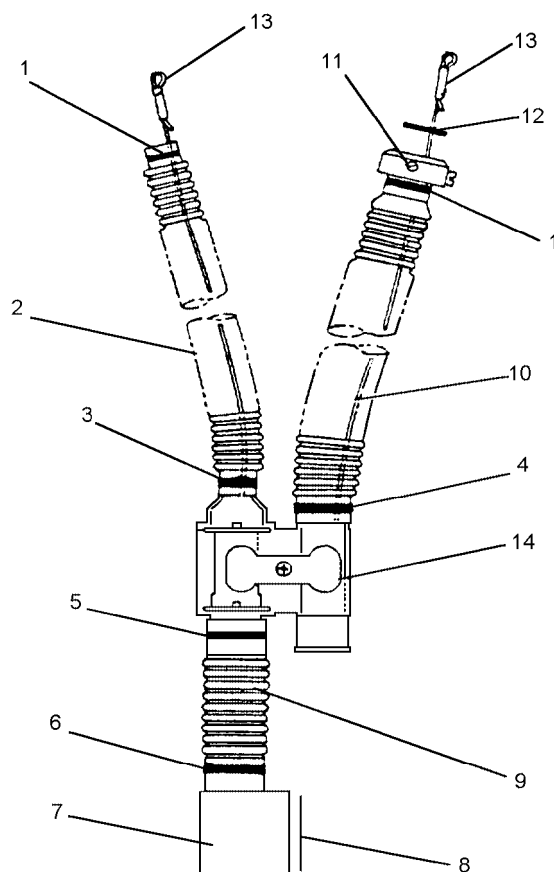


Figure 4-119. Snout Assembly

4-119

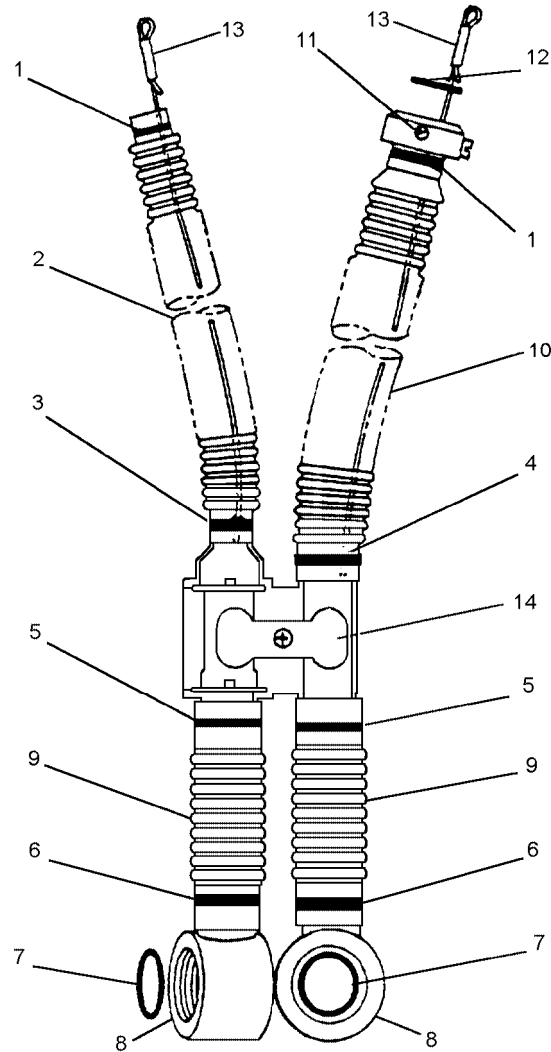
Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
4-119	—	SNOUT ASSEMBLY							REF	
-1	—	. SNOUT							1	
-2	CL 6226	. CABLE TIE, 3.6 MM							1	



4-120

Figure 4-120. Lower Assembly - (V)1 Variant

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
4-120	—	LOWER ASSEMBLY - (V)1 VARIANT	REF	
-1	CL 6227	. CABLE TIE, 4.8 MM	2	
-2	CL 6045	. HOOD INLET HOSE	1	
-3	CL 6592	. STEPLESS LOW PROFILE CLAMP, 16.5 MM ..	1	
-4	CL 6593	. STEPLESS LOW PROFILE CLAMP, 21.9 MM ..	1	
-5	CL 6670	. STEPLESS LOW PROFILE CLAMP, 24.5 MM ..	1	
-6	CL 6594	. STEPLESS LOW PROFILE CLAMP, 26.5 MM ..	1	
-7	CL 6441	. J-MANIFOLD	1	
-8	CL 6442	. GASKET, J-MANIFOLD	1	
-9	CL 6418	. MANIFOLD HOSE	1	
-10	CL 6046	. MASK INLET HOSE	1	
-11	CL 6612	. SCREW, SHEAR	1	
-12	CL 6572	. O-RING	1	
-13	—	. CORD, RESTRAINT	2	
-14	CL 6414	. H-MANIFOLD	1	



4-121

Figure 4-121. Lower Assembly - (V)2 thru (V)4 Variants

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
4-121	—	LOWER ASSEMBLY - (V)2 THRU (V)4 VARIANTS	REF	
-1	CL 6227	. CABLE TIE, 4.8 MM	2	
-2	CL 6045	. HOOD INLET HOSE	1	
-3	CL 6592	. STEPLESS LOW PROFILE CLAMP, 16.5 MM ..	1	
-4	CL 6593	. STEPLESS LOW PROFILE CLAMP, 21.9 MM ..	1	
-5	CL 6670	. STEPLESS LOW PROFILE CLAMP, 24.5 MM ..	2	
-6	CL 6594	. STEPLESS LOW PROFILE CLAMP, 26.5 MM ..	2	
-7	CL 6442	. GASKET, J-MANIFOLD	2	
-8	CL 6441	. J-MANIFOLD	2	
-9	CL 6418	. MANIFOLD HOSE	2	
-10	CL 6046	. MASK INLET HOSE	1	
-11	CL 6612	. SCREW, SHEAR	1	
-12	CL 6572	. O-RING	1	
-13	—	. CORD, RESTRAINT	2	
-14	CL 6414	. H-MANIFOLD	1	

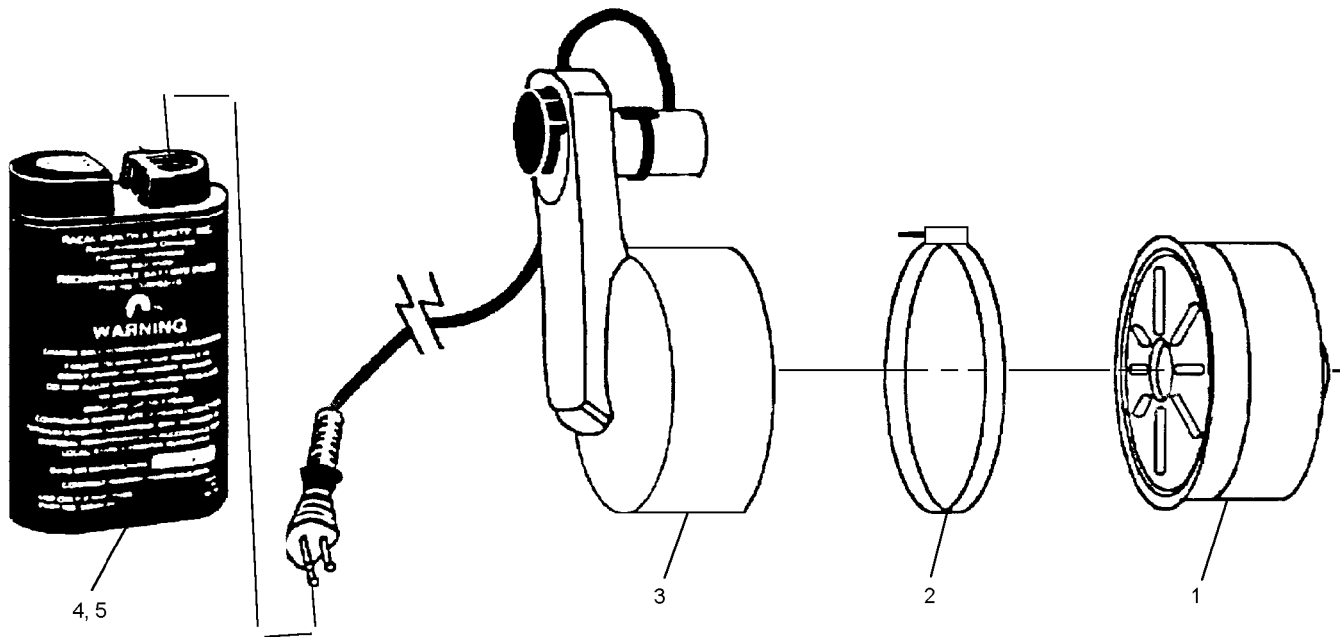
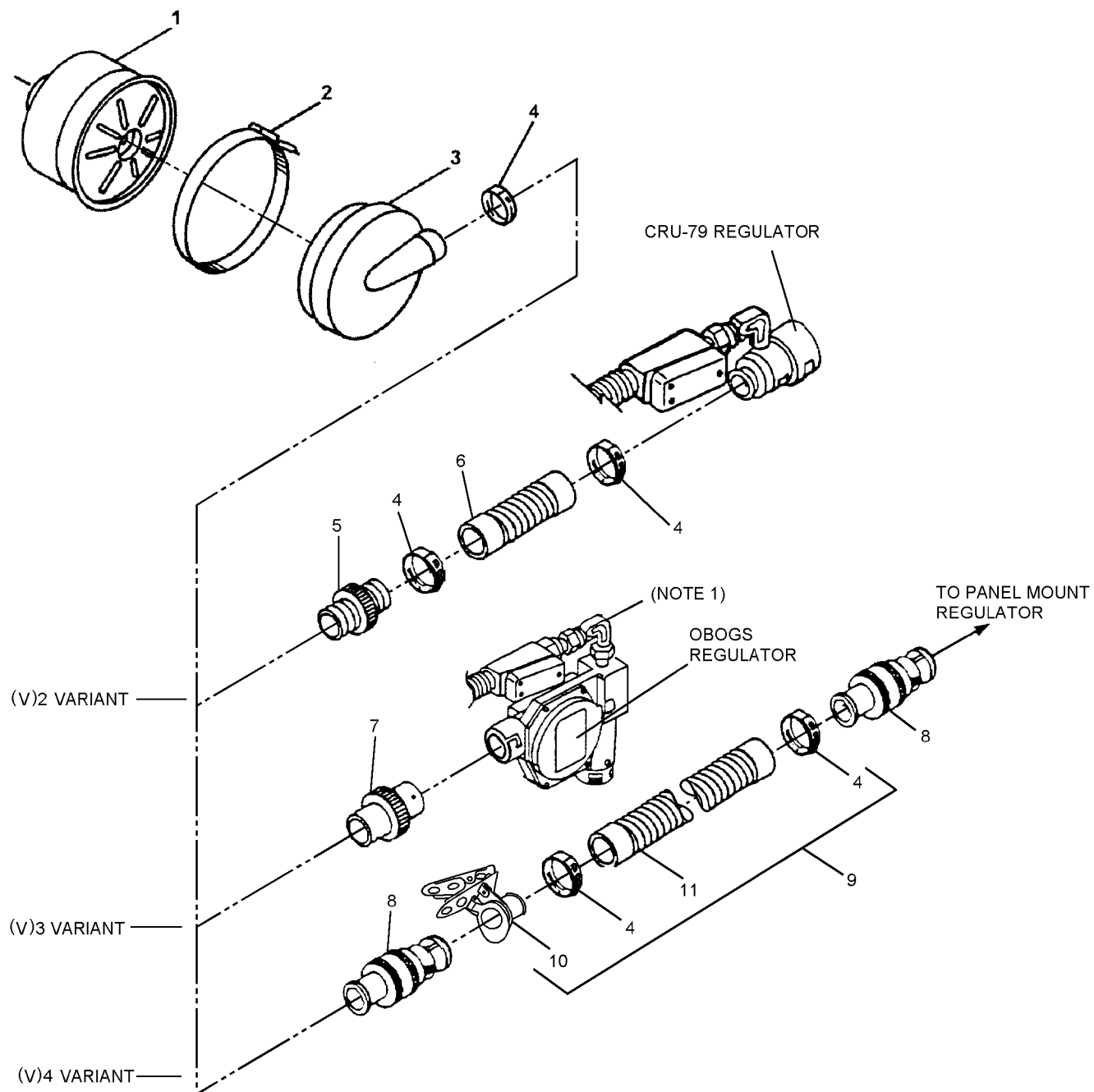


Figure 4-122. Pusher Fan Subassembly

4-122

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
4-122	—	PUSHER FAN SUBASSEMBLY	REF	
-1	DS-3-1520	. C2A1 CANISTER (NOTE 1)	1	
	DS-3-1500	. C2 CANISTER (NOTE 1)	1	
-2	CL 6528	. CABLE TIE, 7.6 MM (18 IN)	1	
-3	CL 6409	. PUSHER FAN	1	
-4	CL 6410	. BATTERY, NICKEL CADMIUM	1	
-5	CL 6433	. BATTERY, LITHIUM MANGANESE	1	
		DIOXIDE		
	Notes: 1. The C2A1 Canister will replace the C2 Canister thru attrition.			



NOTES:

1. 79 ELBOW (LOX HOSE AND CRU-103 REGULATOR)
- 82 ELBOW (CRU-82 REGULATOR)
- CBR ELBOW (CRU-88 REGULATOR OR CRU-103 AND OBOGS HOSE)

Figure 4-123. Oxygen Delivery Subassemblies

004123

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code	
4-123	—	OXYGEN DELIVERY SUBASSEMBLY ((V)2 VARIANT)	REF	A	
	—	OXYGEN DELIVERY SUBASSEMBLY ((V)3 VARIANT)	REF	B	
	—	OXYGEN DELIVERY SUBASSEMBLY ((V)4 VARIANT)	REF	C	
	-1	DS-3-1520 . □C2A1 □ANISTER (NOTE 1) □ DS-3-1500 . □C2 □ANISTER (NOTE 1) □.....	1 1	A, B, C A, B, C	
	-2	CL 6528 . CABLE TIE, 7.6 MM X 18 IN LG	1	A, B, C	
	-3	CL 6404 . RUBBER MOLDING, 90°	1	A, B, C	
	-4	CL 6670 or . STEPLESS LOW PROFILE CLAMP, 4730-00-269-3760 24.5 MM	3	A	
		CL 6670 or . STEPLESS LOW PROFILE CLAMP, 4730-00-269-3760 24.5 MM	2	B, C	
		CL 6670 or . STEPLESS LOW PROFILE CLAMP, 4730-00-269-3760 24.5 MM	2	D	
	-5	CL 6595 . COUPLING, 3/4 INCH TO 3/4 INCH	1	A	
	-6	CL 6703 . HOSE, REGULATOR	1	A	
	-7	CL 6431 or . BAYONET CONNECTOR, 3-PIN	1	B	
		1660-00-730-2247			
	-8	CL 6425 or . QUICK DISCONNECT FITTING	1	C	
		1660-00-981-8383			
		CL 6425 or . QUICK DISCONNECT FITTING	1	D	
		1660-00-981-8383			
	-9	— . HOSE ASSEMBLY, OXYGEN EXTENSION, 48 INCH (NOTE 2)	REF	C, D	
	-10	1660-00-348-2162 . . CONNECTOR, OXYGEN HOSE, TYPE 1	1	D	
	-11	22055H48 or . . HOSE, 48 INCH	1	D	
		4720-00-470-0447			
	Notes: 1. The C2A1 Canister will replace the C2 Canister thru attrition. 2. Usable on Code D is assigned to components of the 48-inch extension hose used in conjunction with the (V)4 variant. Hose Assembly, Style A, P/N MS22055A48 (NSN 1660-00-692-3939) can be procured and includes index numbers 4, 10, and 11.				

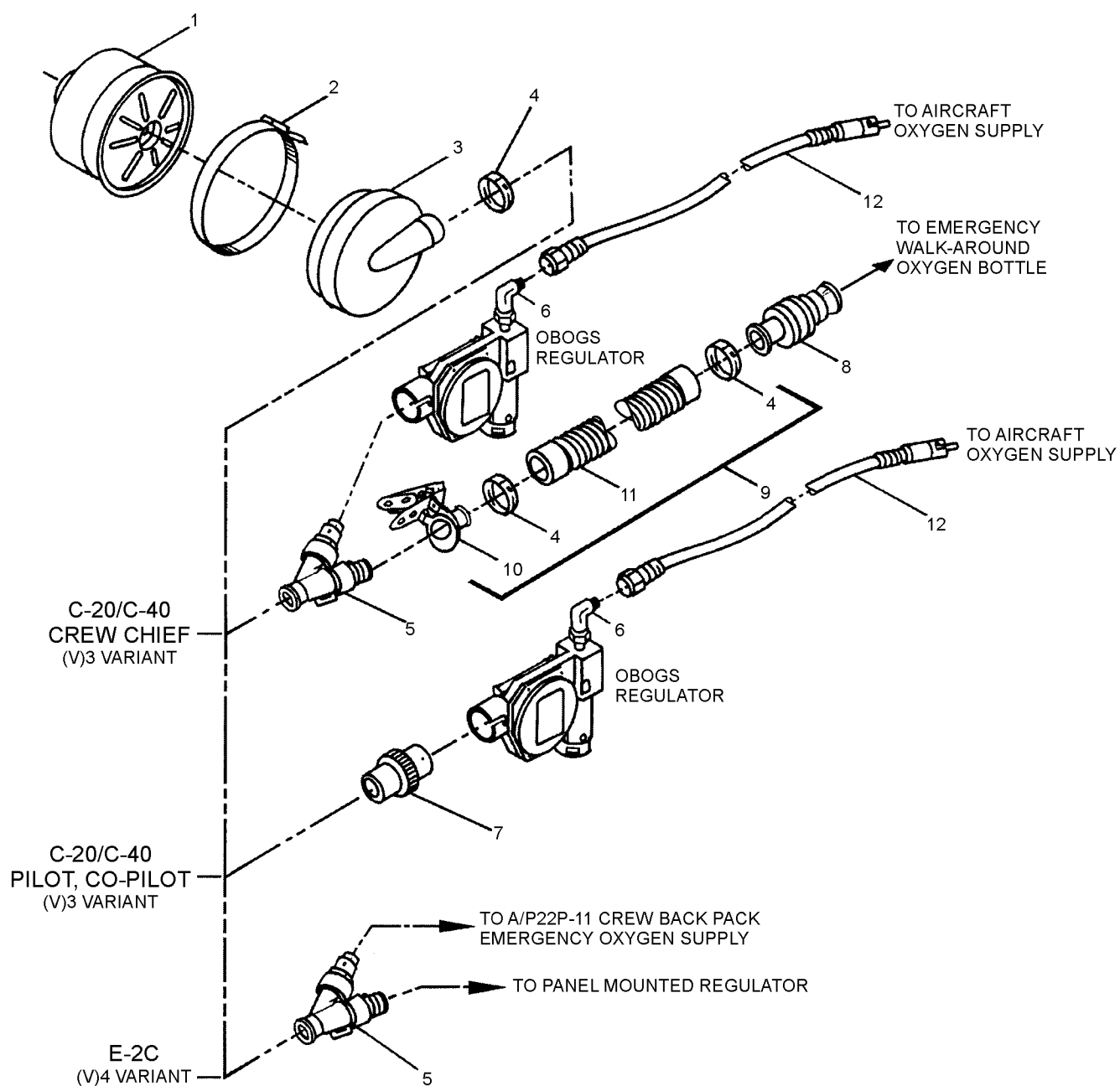


Figure 4-123A. Special Application Oxygen Delivery Subassemblies

004123a

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code	
4-123A	—	OXYGEN DELIVERY SUBASSEMBLY (C-20, C-40 CREW CHIEF (V)3 VARIANT)	REF	A	
	—	OXYGEN DELIVERY SUBASSEMBLY (C-20, C-40 PILOT/CO-PILOT (V)3 VARIANT)	REF	B	
	—	OXYGEN DELIVERY SUBASSEMBLY (E-2C (V) VARIANT)	REF	C	
	-1	DS-3-1520 DS-3-1500	. □C2A1 □ANISTER (NOTE 1) □ □C2 □ANISTER (NOTE 1) □.....	1 1	A, B, C A, B, C
	-2	CL 6528	. CABLE TIE, 7.6 MM X 18 IN LG	1	A, B, C
	-3	CL 6404	. RUBBER MOLDING, 90°	1	A, B, C
	-4	CL 6670 or 4730-00-269-3760	. CLAMP, STEPLESS, LOW PROFILE, 24.5 MM	1	A, B, C
		CL 6670 or 4730-00-269-3760	. CLAMP, STEPLESS, LOW PROFILE, 24.5 MM	2	D
	-5	4730-01-334-3031	. BRANCHED TUBING CONNECTOR, CRK-90(NOTE 3)	1	A, C
	-6	CL 6762	. □CBR □ELBOW (NOTE 4) □.....	1	A, B
	-7	CL 6431 or 1660-00-730-2247	. BAYONET CONNECTOR, 3-PIN	1	B
	-8	CL 6425 or 1660-00-981-8383	. QUICK DISCONNECT FITTING	1	A
	-9	MS22055A48 or 1660-00-692-3939	. HOSE ASSEMBLY, OXYGEN EXTENSION, ... 48-INCH,STYLE A(NOTE 2)	1	A, D
	-10	1660-00-348-2162	. . CONNECTOR, OXYGEN HOSE, TYPE 1	1	D
	-11	22055H48 or 4720-00-470-0447	. . HOSE, 48 IN LG	1	D
	-12	B/E AEROSPACE 4431027-048	. HOSE ASSEMBLY, OXYGEN, AIRCRAFT	1	A, B
		Notes: 1. The C2A1 Canister will replace the C2 Canister thru attrition. 2. Usable on code D is assigned to components of the 48-inch extension hose used in conjunction with the (V)4 variant. Hose Assembly, Style A, P/N MS22055A48 (NSN 1660-00-692-3939) can be procured and includes index numbers 4, 10, and 11. 3. Connector utilized from oxygen mask assembly, MBU-17(V)5/P. 4. Packaged in A/P22P-14(V)3 variant transit case.			

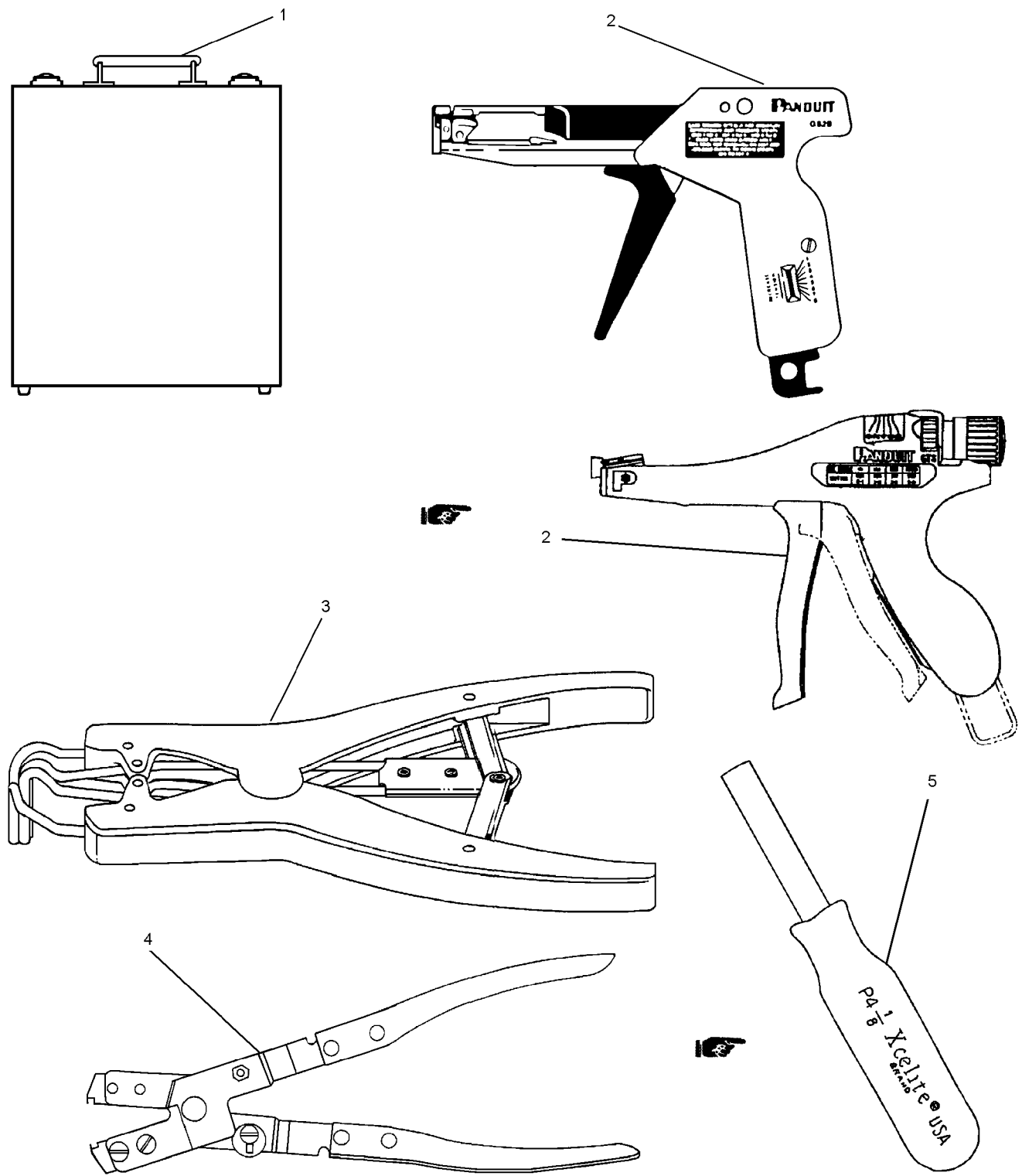


Figure 4-124. Special Support Equipment

004124

NAVAIR 13-1-6.10

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
4-124	—	EQUIPMENT, SPECIAL SUPPORT	REF	
-1	6200005	. TEST SET, RESPIRATOR ASSEMBLY A/E47T-28	1	
-2	MS90387-1	. TOOL, CABLE TIE, STANDARD OR EQUIVALENT	1	
	5120-00-937-5438	. TOOL, CABLE TIE, HEAVY DUTY	1	
-3	5120-01-124-0649	. ELASTRATOR	1	
-4	14100055	. PINCER TOOL, LOW PROFILE	1	*
	5120-01-073-4187	. PLIERS, HOSE CLAMP (NOT ILLUSTRATED)	1	*
-5	191-382	. NUT DRIVER, 1/8 INCH (JENSEN TOOLS OR EQUIVALENT) (Note 1)	1	
Notes :		1. Available from Jensen Tools, Phone: 978-682-9844.		

NUMERICAL INDEX

Part Number	Figure and Index Number	SM&R Code	Part Number	Figure and Index Number	SM&R Code
CL 6045	4-120-2		CL 6585	4-106-4	
	4-121-2		CL 6592	4-120-3	
CL 6046	4-120-10			4-121-3	
	4-121-10		CL 6593	4-120-4	
CL 6131	4-107-6			4-121-4	
CL 6225	4-113-9		CL 6594	4-106-5	
	4-118-2			4-120-6	
CL 6226	4-116-3			4-121-6	
	4-119-2		CL 6595	4-123-5	
CL 6227	4-120-1		CL 6605	4-118-1	
	4-121-1		CL 6612	4-120-11	
CL 6297	4-117-2			4-121-11	
CL 6357	4-109-1		CL 6670	4-120-5	
CL 6383	4-114-2			4-121-5	
CL 6404	4-123-3			4-123-4	
CL 6409	4-122-3		CL 6703	4-123-6	
CL 6410	4-122-4		DS-3-1500	4-122-1	
CL 6414	4-120-14			4-123-1	
	4-121-14		DS-3-1520	4-122-1	
CL 6418	4-120-9			4-123-1	
	4-121-9		MS90387-1	4-124-2	
CL 6425	4-123-8		OP 17652	4-117-3	
CL 6431	4-123-7		14100055	4-124-4	
CL 6433	4-122-5		1660-00-348-2162	4-123-10	
CL 6439	4-113-10		1660-00-730-2247	4-123-7	
CL 6441	4-120-7		1660-00-981-8383	4-123-8	
	4-121-8		22055H48	4-123-11	
CL 6442	4-120-8		4720-00-470-0447	4-123-11	
	4-121-7		4730-00-269-3760	4-123-4	
CL 6489	4-113-7		5120-00-937-5438	4-124-2	
CL 6490	4-113-8		5120-01-073-4187	4-124-4	
CL 6528	4-122-2		5120-01-124-0649	4-124-3	
	4-123-2		62000005	4-124-1	
CL 6564	4-105-2			4-105-1	
	4-107		—	4-106	
CL 6565	4-105-2		—	4-106-1	
	4-107		—	4-106-2	
CL 6566	4-105-2		—	4-106-2	
	4-107		—	4-106-3	
CL 6567	4-105-2		—	4-106-6	
	4-107		—	4-106-7	
CL 6568	4-105-2		—	4-106-8	
	4-107		—	4-107-1	
CL 6569	4-105-2		—	4-107-2	
	4-107		—	4-107-3	
CL 6570	4-105-2		—	4-107-4	
	4-107		—	4-107-5	
CL 6571	4-105-2		—	4-108	
	4-107		—	4-108-1	
CL 6572	4-120-12		—	4-108-2	
	4-121-12		—	4-108-3	

NUMERICAL INDEX (Cont)

Part Number	Figure and Index Number	SM&R Code	Part Number	Figure and Index Number	SM&R Code
—	4-108-2		—	4-113-1	
—	4-108-3		—	4-113-2	
—	4-108-4		—	4-113-3	
—	4-108-5		—	4-113-4	
—	4-108-6		—	4-113-5	
—	4-108-7		—	4-113-6	
—	4-108-8		—	4-113-11	
—	4-108-9		—	4-113-12	
—	4-108-10		—	4-114	
—	4-108-11		—	4-114-1	
—	4-109		—	4-114-3	
—	4-109-2		—	4-114-4	
—	4-110		—	4-115	
—	4-110-1		—	4-115-1	
—	4-110-2		—	4-116	
—	4-110-3		—	4-116-1	
—	4-110-4		—	4-116-2	
—	4-111		—	4-116-4	
—	4-111-1		—	4-117	
—	4-111-2		—	4-117-1	
—	4-111-3		—	4-118	
—	4-111-4		—	4-119	
—	4-111-4		—	4-119-1	
—	4-111-5		—	4-120	
—	4-111-6		—	4-120-13	
—	4-111-7		—	4-121	
—	4-111-8		—	4-121-13	
—	4-112		—	4-122	
—	4-112-1		—	4-123	
—	4-112-2		—	4-123	
—	4-112-3		—	4-123	
—	4-112-4		—	4-123-9	
—	4-112-5		—	4-124	
—	4-113		—	4-124-5	

CHAPTER 5

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CHAPTER 5A

BELOW-THE-NECK (BTN) CLOTHING, AIRCREW MEMBER, CBR PROTECTIVE USING CHEMICAL PROTECTIVE UNDERSHIRT, CMU-34/P AND CHEMICAL PROTECTIVE DRAWERS, CMU-35/P

Section 5A-1. Description

5A-1. GENERAL.

5A-2. Considered the below-the-neck (BTN) portion of respirator assemblies, BTN components are items of clothing and cover. They are designed to complement and enhance the respirator assembly function of protecting aircrewmembers against chemical and biological agents and the effects of nuclear fallout. Included in the BTN ensemble are the following items. See figure 5A-1.

NOTE

In this discussion the below-the-neck protective assemblies are referred to as BTN ensemble, or ensemble.

Chemical Protective Undergarment
Chemical Protective Socks
Disposable Footwear Covers
Aircrew Cape
Chemical Protective Gloves
Chemical Glove Inserts

5A-3. Included in the chapter are descriptive and maintenance information including fitting, storage and cleaning instructions. An illustrated parts listing is also provided.

NOTE

Aircrew may have difficulty operating small knobs/switches when wearing chemical protective gloves.

5A-4. CONFIGURATION.

5A-5. The Below-the-Neck components include items described in paragraphs 5A-6 through 5A-11. Table 5A-1 shows the protection factors for each of the items in the BTN ensemble.

5A-6. CHEMICAL PROTECTIVE UNDERGARMENTS. The chemical protective undergarments consist of an undershirt and a drawer. The fabric is composed of a non-woven material with encapsulated carbon in a stretchable matrix. The chemical protective undergarments, when worn under the flight suit, are somewhat resistant to water, petroleum, oils, and lubricants; however, gross contamination by these POLs may degrade chemical protection. Service life of the undergarments out of the vapor-barrier package is 15 days. The undergarments provide protection from liquid and vapor chemical threat for up to 12 hours after contamination.

5A-7. CHEMICAL PROTECTIVE SOCKS. The chemical protective socks are made of 4-mil polyethylene. They are vapor agent impermeable, which protects the feet from chemical agents. They come in one size only, and are meant to be worn over cotton socks inside the flyer's boots. The socks are disposable items for one-time use.

5A-8. DISPOSABLE FOOTWEAR COVERS. The footwear covers are worn over the flyer's boots. They protect the aircrewmember from contamination en route between the shelter and the aircraft. They must be removed before entering the aircraft. The footwear covers come in three sizes, medium, large, and extra large as indicated in table 5A-2.

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5A-9. AIRCREW CAPE. The aircrew cape is a large, clear, disposable, 4-mil polyethylene bag worn over the body. The cape protects the aircrewmember from liquid contamination en route between the shelter and the aircraft and must be removed before entering the aircraft. It is available in one size only as indicated in [table 5A-2](#).

5A-10. CHEMICAL GLOVE INSERTS. The chemical glove inserts are white, 100% cotton knit and come in three sizes, as shown in [table 5A-2](#). The inserts must be worn under the chemical protective gloves to absorb perspiration. The T3 Insert is a charcoal color and must be issued as a set with the black color T3 Glove ([paragraph 5A-11](#)).

NOTE

T3 Gloves/Inserts are issued as a set (left insert glove, right insert glove, left NOMEX glove, right NOMEX glove).

5A-11. CHEMICAL PROTECTIVE GLOVES. The chemical protective gloves protect hands from chemical agents. They are made of butyl, are 7-mil, 12 inches long or 14-mil, 14 inches long. The gloves come in four sizes as shown in [table 5A-2](#). They are designed for an estimated seven day service life, for twelve hours per day. The T3 Glove is black with extended gauntlet and must be issued with the T3 Insert.

NOTE

Aircrew may have difficulty with operating small knobs/switches when wearing chemical protective gloves.

NOTE

Butyl 7-Mil thick, 12 inch long glove is the preferred CB protective glove for flight.

5A-12. APPLICATION.

5A-13. The clothing ensembles provide protection against chemical and biological warfare agents. They are worn by aircrewmembers in addition to the applicable aircrewmember flight equipment configuration (see NAVAIR 13-1-6.7 Series).

5A-14. FUNCTION AND OPERATION.

5A-15. The respirator assemblies, when worn with the standard flight equipment, provide protection as follows:

1. Head, eye and respiratory system protection is provided by:

- Mask/Hood/Orinasal Mask
- Pusher Fan Subassembly
- Filtered Oxygen Supply (on units so equipped)

2. BTN body protection is provided by:

- Chemical Protective Undergarments (worn over personal underwear)
- Chemical Glove Inserts
- Chemical Protective Gloves
- Chemical Protective Socks

3. Standard aircrewmember protection is provided by NAVAIR 13-1-6.7-2 aircrewmember summer configuration.

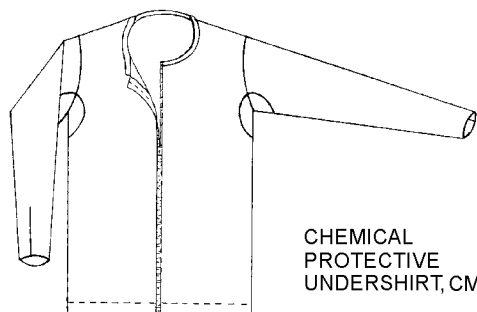
4. Aircrewmembers are protected from contamination between the shelter and the aircraft by:

- Aircrew Disposable Polyethylene Cape
- Disposable Vinyl Footwear Covers

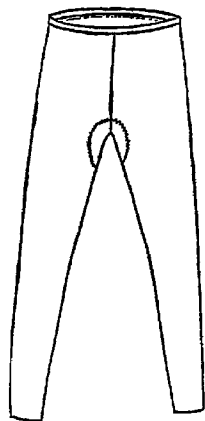
5A-16. COMPONENTS. Refer to [table 5A-2](#) for leading particulars for the BTN ensemble.

Table 5A-1. Aircrew BTN Clothing CBR Protection Factors

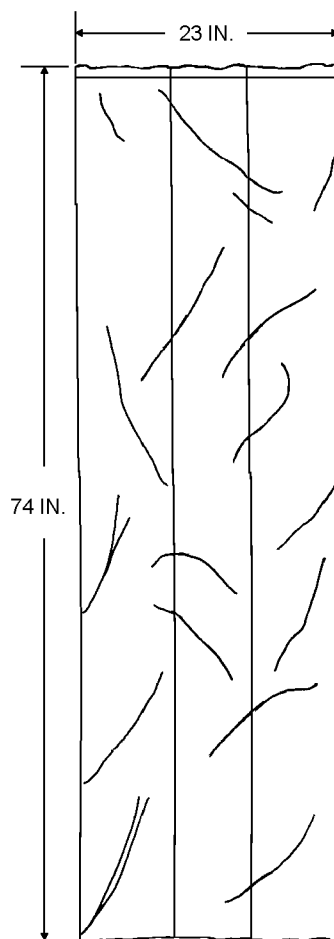
Item	Material	Uncontaminated Service Life
Chemical Protective Undergarments (Note 1)	Carbon/Aramid/Polyester/Lycra Non-woven	15 Days
Protective Socks	4-Mil Clear Polyethylene	One Time Use
Chemical Glove Inserts (Notes 3, 4, and 5)	100% Cotton Knit	No Limit
Protective Gloves (Notes 3, 4, and 5)	7- or 14-Mil Butyl Rubber	Eighty-four (84) Hours
Disposable Footwear Covers (Note 2)	4-Mil Clear Polyethylene	One Time Use
Aircrew Cape (Note 2)	4-Mil Clear Polyethylene	One Time Use
Notes: 1. Item is worn over personal underwear, no cotton long underwear is worn. 2. Doffed prior to aircraft ingress and disposed of. Upon return to base, aircraft captain issues new foot-wear covers and aircrew cape which are donned upon aircraft egress, and worn to ensemble doffing area. 3. T3 Gloves/Inserts are to be issued as a set and are authorized to be used in place of 100% cotton knit inserts and 7- or 14-mil butyl rubber gloves and GS/FRP-2 Fire-Resistant Flyer's Gloves. Uncontaminated Service Life: TBD. 4. Contaminated Service Life: If the 14-mil Butyl Chemical Protective Gloves become contaminated, replace them within 24 hours after exposure. 5. Contaminated Service Life: If the T3 Inserts become contaminated, replace them within 6 hours after exposure.		



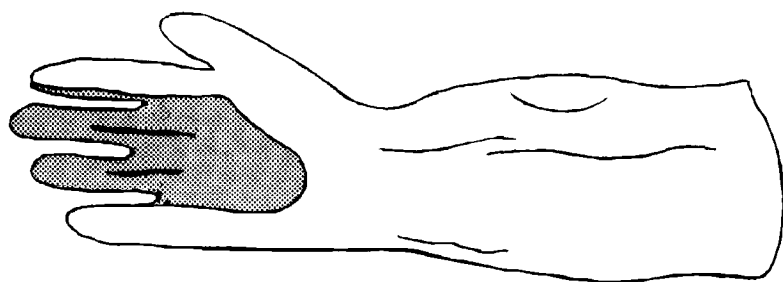
CHEMICAL
PROTECTIVE
UNDERSHIRT, CMU-34/P



CHEMICAL
PROTECTIVE
DRAWERS, CMU-35/P



AIRCREW CAPE



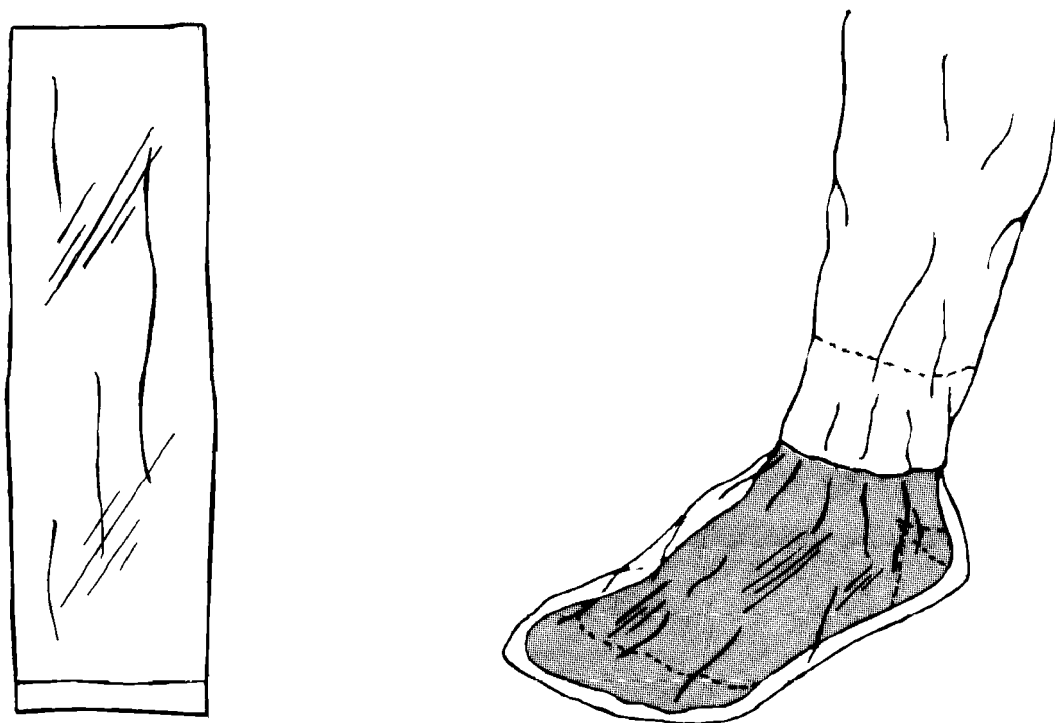
CHEMICAL PROTECTIVE GLOVES



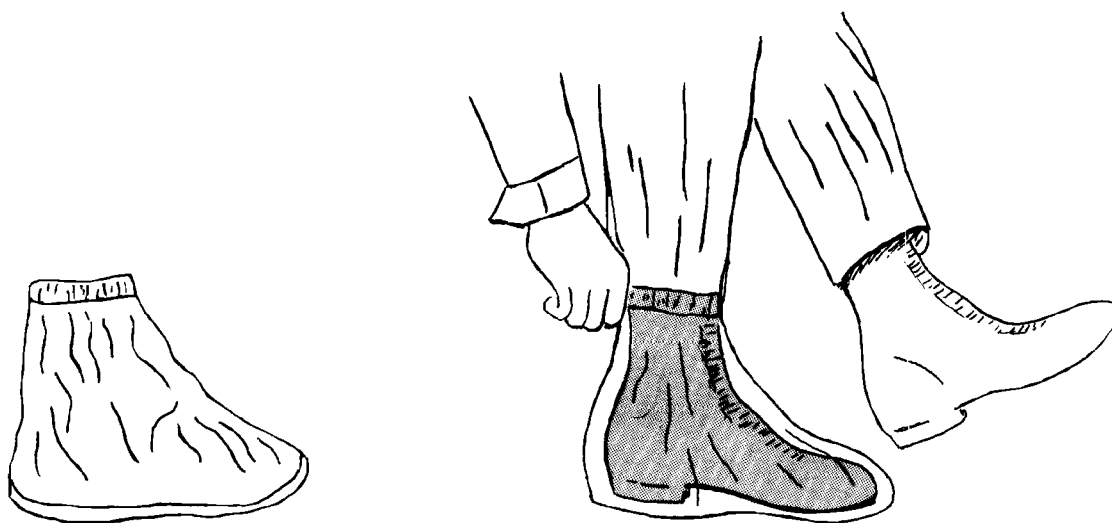
CHEMICAL GLOVE INSERT

5a-1-1

Figure 5A-1. Aircrew Chemical Defense BTN Ensemble Using Chemical Protective Undergarments
(Sheet 1 of 2)



CHEMICAL PROTECTIVE SOCKS



DISPOSABLE FOOTWEAR COVERS

5a-1-2

Figure 5A-1. Aircrew Chemical Defense BTN Ensemble Using Chemical Protective Undergarments
(Sheet 2 of 2)

Table 5A-2. Aircrew BTN Clothing Components

Available Item	NSN	Sizes	Remarks
Chemical Protective Undershirt, CMU-34/P	8415-01-490-1900	30	May be laundered once during its 15-day wear cycle.
	8415-01-490-1901	32	
	8415-01-490-1902	34	
	8415-01-490-1903	36	
	8415-01-490-1904	38	
	8415-01-490-1908	40	
	8415-01-490-1910	42	
	8415-01-490-1911	44	
	8415-01-490-1913	46	
	8415-01-490-1914	48	
	8415-01-490-1915	50	
	8415-01-490-1917	52	
Chemical Protective Drawers, CMU-35/P	8415-01-490-4368	26	May be laundered once during its 15-day wear cycle.
	8415-01-490-4371	28	
	8415-01-490-4372	30	
	8415-01-490-4374	32	
	8415-01-490-4376	34	
	8415-01-490-4378	36	
	8415-01-490-4379	38	
	8415-01-490-4380	40	
	8415-01-490-4381	42	
	8415-01-490-4382	44	
	8415-01-490-4383	46	
	8415-01-490-4384	48	
Chemical Protective Socks	8415-01-040-3169	One Size	Disposable (one-time use only) (500 each per roll) (Unit of issue is, each, not by pair)
Disposable Footwear Covers	8430-00-591-1359	Medium	Disposable (one-time use only)
	8430-00-580-1206	Large	
	8430-00-580-1205	X-Large	
Aircrewmember's Cape	8415-01-040-9018	One Size	Disposable (one-time use only) (100 each per roll)

Table 5A-2. Aircrew BTN Clothing Components (Cont)

Available Item	NSN	Sizes	Remarks
Chemical Protective Gloves	8415-01-138-2501 8415-01-138-2502 8415-01-138-2503 8415-01-138-2504 8415-01-138-2497 (Not ESD 3 nd 2) 8415-01-138-2498 (Not ESD 3 nd 2) 8415-01-138-2499 (Not ESD 3 nd 2) 8415-01-138-2500 (Not ESD 3 nd 2)	Small Medium Large X-Large Small Medium Large X-Large	
Chemical Glove Inserts	8414-01-138-2494 8415-01-138-2495 8415-01-138-2496	Small Medium Large	
T3 Gloves/Inserts	0001AA, T3GLOVE/INSERT 0002AB, T3GLOVE/INSERT 0003AC, T3GLOVE/INSERT 0004AD, T3GLOVE/INSERT	Small Medium Large X-Large	Order from respective TYCOM.
Notes: 1. 14-Mil Gloves, Chemical Protective, Part Number: MIL-G-43976. 2. Aircrew summer flyer's gloves may need to be increased by one or two sizes when wearing the chemical protective gloves. Refer to NAVAIR 13-1-6.7-2 if applicable.			

Section 5A-2. Modifications

5A-17. GENERAL.

5A-18. There are no modifications authorized to the BTN ensemble at this time.

Section 5A-3. Fitting, Donning, and Doffing

5A-19. GENERAL.

5A-20. The concept of fitting in this section follows the normal sequence of events and includes initial fitting and preparation, donning, doffing an uncontaminated BTN assembly and doffing a contaminated assembly.

NOTE

A Technical Data Indoctrination Package is available for CBR Buildup, Fitting and Donning, PIN# 113924. It is available in VHS, CD, DVD or electronically on the PMA-202 Website [HTTPS://pma202.navair.navy.mil/](https://pma202.navair.navy.mil/). For further information, contact your FAILSAFE Representative or Aeromedical Safety Officer.

5A-21. INITIAL FITTING.

5A-22. Initial fitting includes guidelines for fitting the chemical protective undershirt and drawers, chemical protective socks, disposable footwear covers, and glove inserts. All equipment sizes shall be entered on the appropriate OPNAVINST 4790.2 Series form.

5A-23. FITTING OF CHEMICAL PROTECTIVE UNDERGARMENTS. The chemical protective undergarments are to be worn close to the body, next to the skin, over personal underwear and under the CWU-27/P flight suit. Choose the chemical protective undershirt and drawer size only based upon [Table 5A-3](#). The garments come packaged separately so that undershirts and drawers can be individually fit based upon the aircrewmember's measurements. The undershirt has expandable wrist openings with hook and loop closures and a full-length slide fastener. The trousers have an elastic waistband and tapered legs. The undershirt is worn outside of the trousers and extends to hip level. The sleeves and legs of the garments are not to be trimmed.

5A-24. FITTING OF CHEMICAL PROTECTIVE GLOVES AND CHEMICAL GLOVE INSERTS. The glove shall be issued as a set. See [Table 5A-2](#) for available sizes of chemical protective gloves and glove inserts. The aircrewmember should first try on the chemical glove inserts to get a snug, but not restrictive fit. Next, the chemical protective gloves shall be tried on over the chemical glove inserts.

Again, the fit should be snug but not restrictive. Avoid issuing bulky or oversized gloves because the gloves must integrate properly with the GS/FRP-2 fire resistant flyer's gloves. To determine the glove size of the T3 Gloves/Inserts, measure the width of your hand at the widest point between the knuckles on your hand and inside the thumb (do not include the thumb). Cross reference measurements in accordance with the following: small 3.0 in. and below, medium 3.1 to 3.4 in., large 3.4 to 3.6 in., and X-large 3.6 and above.

5A-25. FITTING OF DISPOSABLE FOOTWEAR COVERS. The aircrewmember should try on the disposable footwear covers over the flight boots to find the best fit.

5A-26. FITTING OF CHEMICAL PROTECTIVE SOCKS. The chemical protective socks come in one size only. No fitting is required.

5A-27. DONNING.

NOTE

Donning of Respirator Assembly and below-the-neck clothing shall be supervised by a qualified Aircrew Survival Equipmentman, MOS 6060, in accordance with OPNAVINST 4790.2 Series.

Materials Required		
Quantity	Description	Reference Number
1	Respirator Assembly	See Note
1	HGU Series Helmet	—
1	CWU-27/P Flight Suit	MIL-C-83141
1 Pair	Aircrewmember's Boots	MIL-B-21408 MIL-B-24911
1	Survival Vest	—
1	Torso Harness (if required)	—
1	Anti-g Garment (if required)	—
1	Life Preserver Unit	—

Table 5A-3. Chemical Protective Undershirt and Drawer Sizing

Chemical Protective Undershirt (Note 1)		
Chest Size (inches)	Corresponds To Undershirt Size	
<30	30	
31-32	32	
33-34	34	
35-36	36	
37-38	38	
39-40	40	
41-42	42	
43-44	44	
45-46	46	
47-48	48	
49-50	50	
51-52	52	
Chemical Protective Drawers (Note 2)		
Waist (Inches)	Hip (Inches)	Corresponds to Drawer Size
25-26	34	26
27-28	36	28
29-30	40	30
31-32	42	32
33-34	42	34
35-36	44	36
37-38	46	38
39-40	48	40
41-42	50	42
43-44	52	44
45-46	54	46
47-48	56	48
Notes: 1. If individual hip measurement is larger than chest measurement, use the hip measurement to select size. 2. If measurements indicate different sizes, select larger size drawers.		

Materials Required (Cont)		
Quantity	Description	Reference Number
1 Pair	GS/FRP-2 Fire Resistant Flyer's Gloves	MIL-G-81188
1	Chemical Protective Undershirt	CMU-34/P (see Table 5A-2)
1	Chemical Protective Drawers	CMU-35/P (see Table 5A-2)
1 Pair	Chemical Glove Inserts	see Table 5A-2
1 Pair	Chemical Protective Gloves	see Table 5A-2
1 Pair	Chemical Protective Socks	NIIN 01-040-3169
1 Pair	Disposable Footwear Covers	see Table 5A-2
1	Aircrew Cape	NIIN 01-040-9018
1 Pair	Cotton Socks	—
1 Pair	Prescription ARS Spectacles (if required)	ARS 6540
1	2 Qt. Water Canteen	NIIN 01-118-8173
1	M-1 Canteen Cap	NIIN 00-930-2077
1	Canteen Cover	NIIN 01-118-8175
1	Skull Cap (if desired)	—
1	Sweat Band (if desired)	—
As Required	Powder, Talc	—

NOTE

Refer to Chapter 3 for information on the A/P23P-14A(V) Respirator Assembly.

Refer to Chapter 4 for information on the A/P22P-14(V)1 thru A/P22P-14(V)4 Respirator Assemblies.

5A-28. DONNING THE RESPIRATOR ASSEMBLY AND ASSOCIATED EQUIPMENT. To provide maximum protection, the donning sequence given for the BTN ensemble must be followed. The Aircrew Survival Equipmentman will supervise the

aircrewmembers while they are donning the ensemble. Since every second counts in a chemical/biological attack, it is imperative that the users as well as the Aircrew Survival Equipmentmen become proficient in assembly donning procedures. The donning procedure is as follows:

NOTE

Detailed procedure for fitting respirator assemblies covered in this manual are found in Chapter 3 or 4.

1. Ensure all normal flight equipment, BTN ensemble, and respirator assembly components are on hand and serviceable before beginning to don the protective assembly. Ensure pre-flight equipment checks have been completed and oxygen-configured respirator assemblies are correctly prepared.

2. Ensure that the in-flight communications cords are properly attached to the mask breathing hose (if applicable). The ground communications cord is not compatible with the aircraft cockpit intercom connection, except for some KC-130 aircraft.

3. Aircrewmembers requiring the use of the in-flight amplifier AM-3597C/A need to have each end of the amplifier wrapped with 6 to 8 inches of electrical tape to ensure the amplifier does not disconnect from the helmet/mask communication cords. Electrical tape should be loosely wrapped around the amplifier at this time so the tape will be available for final wrapping of the amplifier upon ingress into the cockpit.

4. Don the protective socks over the aircrewmembers' socks. The protective socks should be positioned so that no excess material is under the foot and so that the seam is flat on the floor in front of the foot. Fold excess material around the foot. Masking tape may be used to hold folds around the foot. Fold excess material smoothly along the calf. Masking tape may be used to secure the protective sock to the calf and ensure that they remain properly positioned and tucked under the chemical protective drawers pant leg.

5. Don the chemical protective drawers over cotton underwear.

6. Don the chemical protective undershirt over the cotton undershirt. Pull slide fastener fully closed.

7. Don the flight suit and close the slide fastener to the abdomen.

8. Don the flight boots. The bootlaces should be completely loosened to facilitate donning the protective socks. Tuck the chemical protective drawers into the top of the boots prior to tightening up the boot laces. The flight suit should be worn pulled down over the outside of the boots.

8A. Don the anti-g suit and don the torso harness to the waist.

9. Don personal prescription Aircrew Respirator Spectacles (ARS 6540) if vision correction is required.

10. Don a skullcap and/or sweat band (optional). Use of an absorbent skullcap and/or sweat band will improve comfort and keep perspiration from running into the eyes.

11. Check that the respirator assembly hood outlet valve is open (out).

12. Turn the pusher fan ON to supply breathing air and prevent misting of the visual area of the faceplate.

13. Don the mask:

WARNING

When donning the mask do not overextend or damage the neck seal.

a. While the assistant maintains the position of the ARS, sweat band, and skull cap with their hand, place the mask assembly over the head. One method is to grasp the neck seal with both hands, open it fully, place the front of the neck seal under the chin, and pull the neck seal and hood back over the head. A second method is to insert both hands into the neck seal and spread it open wide enough to slide it directly down over the head. The assistant will hold the manifold and lower assembly during this process.

b. Situate the mask for comfort and maximum visibility. The lower lip of the orinasal mask should rest between the lower lip and chin.

c. The assistant will ensure that the neck seal lies flat on the neck and is not rolled or bunched.

d. Test exhalation valve assembly. Request wearer to exhale; ensure air flows from the exhalation

valve assembly to the environment. Pinch-off mask inlet hose and request the wearer to inhale; wearer should experience an inability to breathe. Release hose.

e. Ensure the aircrewmember is familiar with the location of the anti-suffocation disconnect and faceplate ripaway tab or toggle and their operation.

CAUTION

Ensure shoulder skirt material does not catch in the slide fastener and neck bellows remains outside of flight suit collar. Be sure shoulder skirt is not tucked in too tightly, as this can restrict mobility.

14. While the aircrewmember holds the pusher fan, battery pocket and oxygen related equipment, as applicable, the assistant will tuck shoulder skirt of respirator assembly under flight suit at the shoulders. To maximize comfort and mobility, ensure the skirt lies flat and that neck bellows remains near but outside flight suit collar. After positioning skirt, close the flight suit slide fastener to the neck.

15. Don the torso harness by placing arms through torso harness and zipper and buckle.

16. Don the survival vest.

a. While the aircrewmember holds pusher fan, battery pocket or overvest, as applicable, the assistant will don the vest on the aircrewmember and close slide fastener.

b. The assistant will attach pusher fan and battery pocket to survival vest or don the CBR overvest CMU-29(V)2P on the aircrewmember.

c. The assistant will engage the hooks and assist in any adjustments. Ensure hoses lie on the outside of survival vest.

NOTE

A very light dusting of talc on the outside of the hood or a second thin skullcap can be used to facilitate helmet donning.

17. Don the flight helmet.

a. Turn the pusher fan OFF; deflate hood.

b. Place flight helmet on the head over respirator assembly's hood. To maximize field of view, don the helmet fore to aft to minimize hood material slack in the temple area. The faceplate should lie within the helmet edge roll.

c. The assistant will assist in securing and adjusting chin and nape straps as required.

d. Check for proper operation of helmet visor.

e. Turn pusher fan ON.



Ensure intercommunications set is turned off prior to removing or installing batteries.

18. Connect and check the intercommunications unit for proper operation:

NOTE

The AM-3597C/A amplifier, if installed, must be temporarily removed for the intercommunications unit to operate properly.

a. Connect intercom unit to mask microphone and aircrew helmet with the appropriate ground communications cord as shown in figure 4-17.

b. Check for proper operation by actuating the intercommunications unit and alternately speaking and listening. Secure the intercommunications unit to the survival vest by clipping the snap hook to one of the upper D-rings located on the survival vest.

19. Secure mask to helmet and adjust toggle harness:



For proper retention of the helmet, the toggle harness must lie over hooks provided on V-bow.

a. The assistant will connect CBR adapter straps to helmet. The toggle harness cables shall lay over the hooks on the faceplate.

b. Position mask, then rotate V-bow down to lock into flight position.

c. Adjust harness tension to obtain a good seal between mask and the face by rotating V-bow up, turning adjustment sleeves on each harness wire, then rotating V-bow down to check tension and fit; repeat as often as necessary. To provide a comfortable fit, ensure there is equal tension on both sides of mask.

NOTE

Check for proper fit by clamping hood inlet hose shut by using finger and thumb pressure while the filtered air supply is flowing. While holding breath, check to see if air is leaking out from the edge of the mask. Readjustment of toggle harness may be required to assure a good seal and comfortable fit.

d. Ensure proper operation of nose occluder. If unable to valve, repeat steps b, c and d, or repeat nose occluder as shown in Chapter 3 or 4, as applicable.



The canteen is not authorized for in-flight use in ejection seat aircraft.

Keep the drink facility quick disconnect plugged into a canteen or its holder to reduce the chance of contamination.

Disconnect the drink facility quick disconnect from the canteen by pulling and twisting, and plug it into its holder prior to emergency egress.

20. Hang a filled canteen and pouch on the right side of the aircrewmember using the strap provided. The assistant will help in routing the canteen strap, ensuring strap does not interfere with hoses and communications cords. The strap should be placed on the left shoulder, then routed across the body to the right side of aircrewmember. The canteen cap should face forward. Remove drink facility quick disconnect from its holder and attach it to canteen by snapping up flap on top of the M-1 canteen cap using a firm twisting motion to push it into the receiver fitting of cap. Wetting canteen cap will facilitate connection.

NOTE

When donning the canteen and strap, be certain to use a qualified PR or helper for proper canteen strap routing. The canteen strap is routed UNDER the respirator hoses and intercom cord and OVER the left shoulder, clear of the life preserver lobes. The canteen is worn on the right side with the canteen cap facing forward.

21. Roll up flight suit and chemical protective undershirt sleeves and don the gloves:

WARNING

T3 Inserts shall not be cut for any reason.

NOTE

Material between the glove fingers may be cut or split approximately one half inch between the “V” of each finger to increase flexibility.

a. Don the cotton glove inserts or the T3 Inserts.

NOTE

If using T3 Inserts, skip step b.

b. Don the butyl protective gloves. Ensure gloves are pulled all the way onto the hands and arms and lie smoothly on the arms.

c. Roll down the chemical protective undershirt sleeves and secure velcro around the protective gloves and wrist.

d. Don flight gloves. Roll down flight suit sleeves over flight gloves, and secure at the wrists using flight suit’s velcro tabs.

WARNING

Donning and doffing the aircrew protective cape may generate static electricity. Caution shall be taken when working with sensitive electrical components or around jet fuels or other flammable vapors.

22. Don disposable footwear covers and aircrew cape in a liquid threat environment.

CAUTION

When removing and discarding aircrew-member’s disposable protective capes and footwear covers, care shall be exercised to ensure they are not drawn into jet engine air intakes.

NOTE

See NAVAIR A1-NBCDR-OPM-000 for information on aircraft ingress and egress.

23. On arrival at aircraft, the aircrewmember’s protective cape and footwear covers shall be doffed and discarded outside aircraft to prevent contaminating the aircraft.

24. Protective footwear covers and capes shall be available to the aircrew for return trip from aircraft to shelter.

5A-29. DOFFING AN UNCONTAMINATED ENSEMBLE.

5A-30. Aircrewmembers should doff an uncontaminated ensemble in the following order:

NOTE

When feasible, a qualified Aircrew Survival Equipmentman (PR) or other trained assistant shall assist the aircrewmember in doffing the CBR protective assembly.

Materials Required

Quantity	Description	Reference Number
As Required	M-8/M-9 Detector Paper	NIIN 01-049-8982

WARNING

Do not handle suspected contaminated items unless wearing chemical protective equipment. Failure to wear proper protective clothing may result in disability, serious injury, or death.

Aircrewmembers must be checked with M-8/M-9 detection paper for contamination prior to assuming they are uncontaminated.

Personnel wearing contaminated equipment shall report to the nearest decontamination station for removal of contaminated systems.

1. Remove protective cape and footwear covers. These shall be disposed of by an Aircrew Survival Equipmentman.

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2. Doff canteen. Remove drink facility quick disconnect from the M-1 canteen cap, and replace quick disconnect in its holder.

3. Open velcro tabs on flight suit sleeves and remove flight gloves. Remove CBR protective gloves and cotton glove inserts.



Ensure microphone cords are fully unplugged. If not, damage to microphone and/or cords can occur. Do not tug cord to unplug.

4. Disconnect microphone lead of the mask from the pigtail on the back of the helmet. Remove the communications cord from the pigtail and the intercommunications unit. This turns the unit off. Unclip the intercommunications unit snap hook from the D-ring on vest.

5. Remove helmet mounted devices (e.g., NVIIS) and raise all visors.

6. Rotate the V-bow on mask to the UP position.

7. The assistant will remove CBR adapter straps from helmet.

8. Unsnap helmet chin strap and doff helmet.

9. With the assistant's help, separate the pusher fan and battery pocket from survival vest. This is accomplished by pulling to the right on the ribbon, which releases the locking pin of the quick release assembly on the rear of pocket.

10. With aid of the assistant, open survival vest slide fastener, unhook leg lines, and doff survival vest. Remove anti-g garment and torso harness as applicable.

11. Open flight suit slide fastener to waist level and remove the shoulder skirt of respirator from under flight suit.



When doffing mask assembly do not overstretch and/or damage the neck seal.

12. Doff mask by inserting thumbs under neck seal in front, then stretch and lift the mask up over face and to the back. A second method is to insert thumbs under neck seal from the back, then stretch and lift mask over the back of the head toward the front. Leave pusher fan on to maintain airflow to mask.

13. Doff skull cap, sweat band, and ARS (if worn).

14. Remove flight boots.

15. Remove remainder of flight suit.

16. Doff chemical protective undergarments. Return to Aircrew Survival Equipmentman for inspection and verification of remaining service life.

17. Take off chemical protective socks and cotton underwear. The chemical socks shall be disposed of by an Aircrew Survival Equipmentman.

5A-31. DOFFING A CONTAMINATED ENSEMBLE.



Do not handle suspected contaminated items unless wearing chemical protective equipment. Failure to wear proper protective clothing may result in disability, serious injury, or death.

5A-32. Aircrewmembers in contaminated equipment must report to the nearest decontamination station to doff the contaminated equipment.

NOTE

Refer to U.S. Navy CBR Defense/U.S. Marine Corps NBC Defense Handbook (OPNAV P-86-1-95) and Operational Instructions, Naval Aviation, Nuclear, Biological and Chemical (NBC) Defense Resource Manual (NAVAIR A1-NBCDR-OPM-000) for additional information concerning donning and doffing contaminated individual protective equipment.

Section 5A-4. Maintenance

5A-33. GENERAL.

5A-34. This section contains the procedures for inspection, cleaning, and storage of the below-the-neck (BTN) items.

5A-35. ENVIRONMENTAL CONSIDERATIONS. All maintenance and storage operations shall be conducted in a clean area.

5A-36. INSPECTIONS.

NOTE

Only a small quantity of BTN ensembles shall be opened or removed for in-flight proficiency training and for fitting aircrew.

5A-37. PLACE-IN-SERVICE INSPECTION. The Place-in-Service Inspection shall be performed on the BTN ensemble by a qualified Aircrew Survival Equipmentman (PR), MOS 6060, prior to placing in service. The inspection shall include unpacking, visual inspection, and functional checks and shall be performed at the lowest maintenance level possible. The Place-in-Service Inspection shall not be performed on war reserve items until there is a need to issue the items. War reserve items shall remain in protective packaging while in storage. To perform the Place-in-Service Inspection, proceed as follows:

- 1. Remove the items of the BTN ensemble from the packaging.
- 2. Check the BTN ensemble for cuts, tears, holes, separations at the seams, abrasions, fungus, deterioration, stains or any other evidence of damage which would degrade performance.
- 3. Check slide fastener on the chemical protective undershirt for proper operation in both directions.
- 4. Mark training assets in accordance with OPNAVINST 4790.2 Series.
- 5. Perform fitting specified in paragraph 5A-23.
- 6. Document in accordance with OPNAVINST 4790.2 Series.

5A-38. PREFLIGHT INSPECTION. The Preflight Inspection for proficiency training BTN ensembles shall include a visual examination to ensure that all items of the ensemble are present and in good condition prior to donning. The visual inspection shall be performed by the aircrewmember. The Preflight Inspection of war reserve ensembles shall consist of the same visual inspection as the training ensembles and include a check by a qualified Aircrew Survival Equipmentman (PR), MOS 6060, to ensure that the service life has not expired. To perform the inspection, proceed as follows:

- 1. Check the appropriate OPNAVINST 4790.2 Series form for Time-in-Service of the chemical protective undergarment and the chemical protective gloves. Ensure that the Time-in-Service, when added to the expected time of the upcoming mission, does not exceed the service life. If the service life is exceeded, dispose of the item and issue a new item. Time-in-Service for the chemical protective undergarments is limited to 15 days. Time-in-Service for the protective gloves is estimated at seven days when worn for 12 hours a day.
- 2. Check the BTN ensemble for cuts, tears, holes, separations at the seams, abrasions, fungus, deterioration, stains, Petroleum, Oil, and Lubricants (POL) contamination, excessive odor, or any other evidence of damage which would degrade performance.

5A-39. POSTFLIGHT INSPECTION OF WAR RESERVE BTN ENSEMBLES. The Postflight Inspection of War Reserve BTN Ensembles shall include a contamination check, visual inspection, functional check of slide fastener, cleaning, and recording of time in service. The inspection shall be performed by a qualified Aircrew Survival Equipmentman (PR), MOS 6060, at the lowest maintenance level possible. To perform the Postflight Inspection, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	M-8/M-9 Detector Paper	NIIN 01-049-8982
As Required	Talc	—

WARNING

Anyone handling suspected contaminated items must wear chemical protective equipment. Failure to wear proper protective equipment may result in disability, serious injury or death.

1. Check the War Reserve BTN Ensemble with M-8/M-9 Detector Paper for contamination. If contamination is present, contact the NBC Officer immediately for further instructions. If contamination is not present, continue with Postflight Inspection.

2. Dispose of the aircrew cape, chemical protective socks, and the footwear covers.

3. Check the service life of chemical protective undergarment and chemical protective gloves. Dispose of them if the service life is expired or is within four hours of expiration.

4. Inspect remaining items of BTN ensemble for cuts, tears, holes, separation at the seams, abrasion, fungus, deterioration, stains, POL contamination, excessive odor, or any other evidence of damage which would degrade performance. Dispose of any items that are beyond repair and cleaning limits listed in paragraph 5A-44.

5. Check slide fastener on the chemical protective undershirt for proper operation in both directions.

NOTE

The chemical protective undergarments and protective gloves must be dry before returning to storage.

6. Hang chemical protective undergarments to air dry in a sheltered area free of chemical vapors (i.e., agent, adhesive, toluene, etc.).

7. Wipe dry the inside and outside of chemical protective gloves. Apply a light dusting of talc to prevent sticking.

8. Launder chemical glove inserts, chemical protective undershirt, and chemical protective drawers in accordance with paragraph 5A-42. The chemical protective undershirt and drawers may be laundered an unlimited number of times during training life.

9. Issue new items to replace all items that were disposed.

10. Document service time of the war reserve BTN ensemble in accordance with OPNAVINST 4790.2 Series.

5A-40. POSTFLIGHT INSPECTION OF TRAINING BTN ENSEMBLES. The Postflight Inspection of Training BTN Ensembles shall include a visual inspection, a functional check of the slide fastener, and cleaning. The Postflight Inspection shall be performed by qualified Aircrew Survival Equipmentman (PR), MOS 6060, at the lowest maintenance level possible. To perform the Postflight Inspection, proceed as follows:

1. Dispose of aircrew cape, chemical protective socks, and footwear covers.

2. Inspect the remaining items of BTN ensemble for cuts, tears, holes, separations at the seams, abrasion, fungus, deterioration, stains, POL contamination, odor or any other signs of damage which would degrade performance. Dispose of any items which are beyond repair and cleaning.

3. Check slide fastener on the chemical protective undershirt for proper operation in both directions.

NOTE

The chemical protective undergarments and the chemical protective gloves must be dry before returning to storage.

4. Hang chemical protective undergarments to air dry in a sheltered area free of chemical vapors (i.e., agent, adhesive, toluene, etc.).

5. Wipe inside and outside of chemical protective gloves dry.

6. Issue new items to replace any items which were disposed.

7. Launder chemical glove inserts, chemical protective undershirt, and chemical protective drawers in accordance with paragraph 5A-42. The chemical protective undershirt and drawers may be laundered an unlimited number of times during training life.

8. Document in accordance with OPNAVINST 4790.2 Series.

Table 5A-4. Shelf Life of BTN Ensemble Items

Part	Shelf Life Code	Time in Years
Chemical Protective Undershirt	9	8
Chemical Protective Drawers	9	8
Chemical Protective Socks	0	NA
Chemical Glove Inserts	0	NA
Chemical Protective Gloves	9	5
Disposable Footwear Covers	0	NA
Aircrew Cape	0	NA

5A-41. SHELF LIFE INSPECTION. BTN ensemble items should be checked regularly to ensure their capability to protect the user. Table 5A-4 provides shelf life of assembly items. Type II items with a shelf life of 60 months or more are coded 9. Those items with a non-deteriorative storage time period are coded 0.

5A-42. CLEANING AND SERVICE LIFE.

5A-43. Cleaning procedures for noncontaminated BTN equipment are listed as follows:

1. The chemical protective socks, footwear covers and aircrewmember's cape are one-time-use items. These items shall be disposed of after one use. Cleaning of these items is not required.

2. In a noncontaminated environment, the chemical protective undergarments have a service life of 15 days of wear. Maximum agent exposure during their service life shall be a one-time 12-hour agent exposure limit. The chemical protective undergarments are launderable once during their 15-day wear life.

NOTE

Prior to laundering and drying, make sure all slide fasteners are engaged and hook and pile tapes are fastened.

3. The chemical glove inserts, chemical protective undershirt, and chemical protective drawers are launderable. They should be machine laundered in detergent, rinsed, and dried at the coolest setting to prevent shrinkage. The chemical glove inserts shall be laundered after each use. The chemical protective undershirt and drawers may be laundered once during their 15-day wear life.

4. The chemical protective gloves are washable. Wash as necessary to remove petroleum products (oils, lubricants, etc.). The gloves may be sponge wiped with detergent and warm water, rinsed and air dried. Apply a light dusting of talc to prevent tacky surface. The chemical protective gloves have a service life of 7 days at 12 hours per day. If the time in service exceeds either the 12 hours per day (period of use) or the 7 days of use, dispose of gloves and issue a replacement pair.

5. The T3 Glove/Insert can be washed for hygienic purposes during the 14 day service life. The 14 day service life may be extended to 15 days. Proper care and cleaning instructions in a non-contaminated environment are as follows:

a. The outside of the glove and glove insert may be washed while the product is being worn. Simply hand wash the outside of glove with mild soap and water like one is washing their hands. Rinse with clean water. Always dry the glove slowly away from places of extreme heat, like hot radiators, stove or fire boxes.

CAUTION

The following step must be strictly followed to ensure that the insert is not damaged.

b. The inside of the glove insert may be cleaned with a disinfecting solution. Disinfecting solution may be made from laundry bleach by thoroughly mixing a solution of 1.5 oz of laundry bleach with 1 gallon of water to provide approximately 600 ppm available chlorine by weight. Fill inside of glove to within 3

inches of the cuff opening with disinfecting solution. Close off cuff and shake vigorously for approximately 10 seconds. Pour out solution and squeeze out excess solution, from fingertips down to cuff. Rinse with water after treatment. To dry, carefully invert glove insert as much as possible at cuff opening and allow to air dry.

c. The glove may be cleaned with the same disinfecting solution. Immerse the entire glove in the disinfecting solution for 30 seconds. Stir in the solution for 10 seconds, leave the glove in the solution for an additional 30 seconds. Rinse with water after treatment. To dry, squeeze out excess of water, from fingertips down to cuff. Dry slowly away from places of extreme heat, like hot radiators, stoves or fire boxes.

d. Using the recommended procedure above, washing everyday up to the recommended life of the glove should not degrade its performance.

e. Drying time will vary depending on room temperature and relative humidity present.

5A-44. DECONTAMINATION.

WARNING

Anyone handling suspected contaminated items must wear chemical protective equipment. Failure to wear the proper protective equipment may result in disability, serious injury, or death.

5A-45. Dispose of all contaminated BTN equipment in accordance with NBC procedures.

5A-46. REPAIRS.

5A-47. Modifications to the chemical protective equipment listed in this chapter are not authorized. Corrective maintenance actions to the chemical protective gloves, inserts, socks and footwear covers are not authorized. Corrective maintenance for rips and seam openings is authorized to the chemical protective undergarments. Sewing repairs may be performed at the lowest possible maintenance level.

1. To mend a ripped seam, overlap the two edges and hand sew or 301 machine stitch with straight, small stitches.

2. To repair a tear, place the two edges together and neatly hand sew using a whip stitch.

3. To mend a frayed edge, turn the frayed edge under and hand sew or 301 machine stitch the turned edge.

4. To perform a field expedient repair, sew or field tape the garment.

a. Sewing. Loosely whip stitch a rip or tear, keeping the seam as flat as possible. Trim all thread ends.

b. Field taping. Keeping rip or tear as flat as possible, tape over the puncture using duct tape or other tape sufficient to patch. Cut the appropriate size of tape to cover the rip or tear. Round the edges of the tape to reduce fraying. Place the tape over the rip or tear and press firmly.

5A-48. STORAGE.

5A-49. Store in clean, dry area free of chemical vapors (i.e., agent, adhesive, toluene, etc.).

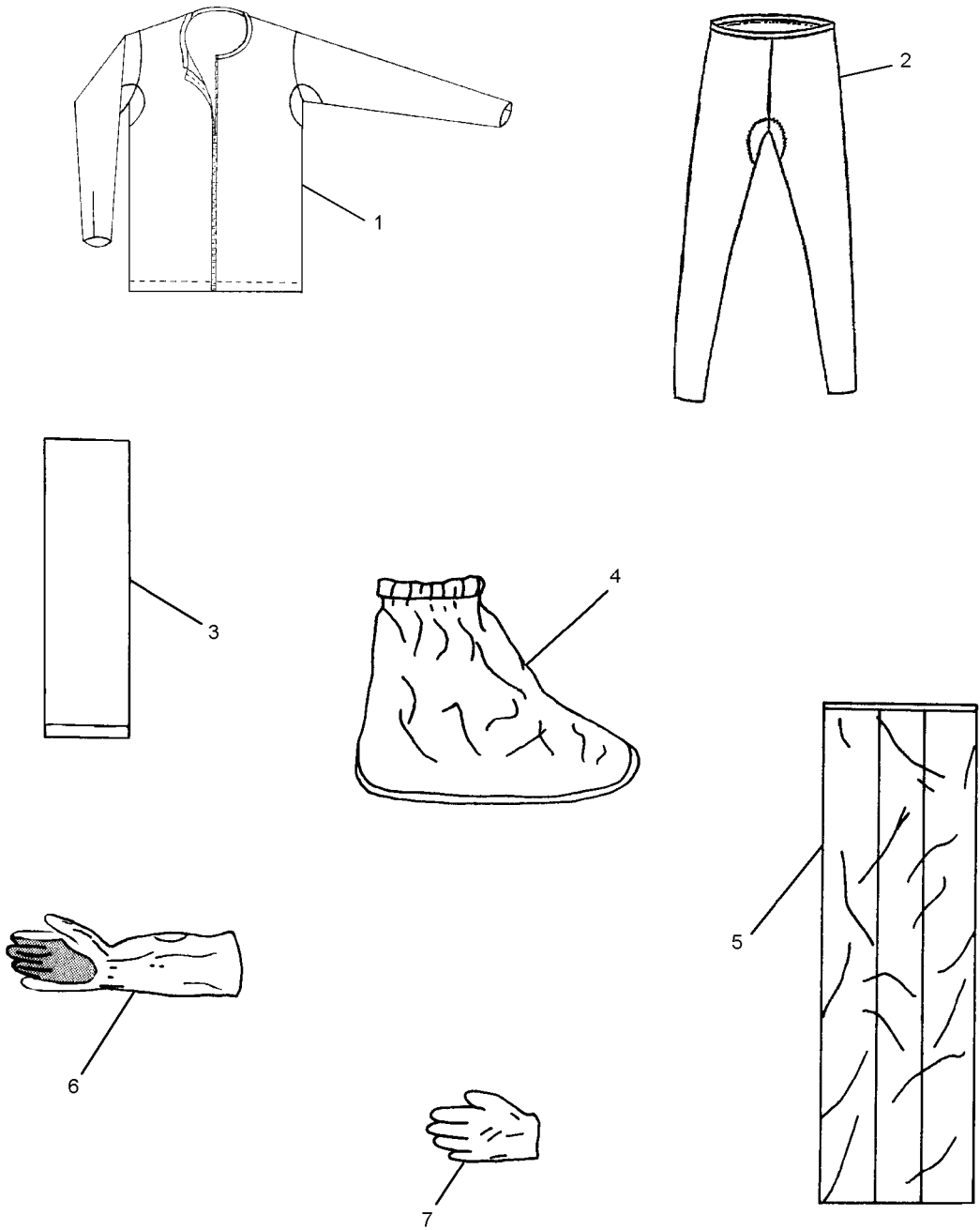
Section 5A-5. Illustrated Parts Breakdown

5A-50. GENERAL.

5A-51. This section lists and illustrates the detailed components of aircrewmembers' CBR Protective BTN clothing. The IPB is intended for use in identification, procurement, and the issuance of replacement components.

NOTE

For more complete information on the IPB and Group Assembly Parts List, refer to [Chapter 2](#), [Section 4](#), [NAVSUPINST 4423.29](#), [OPNAVINST 4410.2A](#), and [NAVSUP P-719](#).



**Figure 5A-2. Below-the-Neck (BTN) Clothing, CBR Protective
Using Chemical Protective Undergarments**

NAVAIR 13-1-6.10

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
5A-2		BELOW-THE-NECK (BTN) CLOTHING, CBR PROTECTIVE	REF	
-1	8415-01-490-1900	. UNDERSHIRT, CHEMICAL PROTECTIVE CMU-34/P, SIZE 30	1	
	8415-01-490-1901	. UNDERSHIRT, CHEMICAL PROTECTIVE CMU-34/P, SIZE 32	1	
	8415-01-490-1902	. UNDERSHIRT, CHEMICAL PROTECTIVE CMU-34/P, SIZE 34	1	
	8415-01-490-1903	. UNDERSHIRT, CHEMICAL PROTECTIVE CMU-34/P, SIZE 36	1	
	8415-01-490-1904	. UNDERSHIRT, CHEMICAL PROTECTIVE CMU-34/P, SIZE 38	1	
	8415-01-490-1908	. UNDERSHIRT, CHEMICAL PROTECTIVE CMU-34/P, SIZE 40	1	
	8415-01-490-1910	. UNDERSHIRT, CHEMICAL PROTECTIVE CMU-34/P, SIZE 42	1	
	8415-01-490-1911	. UNDERSHIRT, CHEMICAL PROTECTIVE CMU-34/P, SIZE 44	1	
	8415-01-490-1913	. UNDERSHIRT, CHEMICAL PROTECTIVE CMU-34/P, SIZE 46	1	
	8415-01-490-1914	. UNDERSHIRT, CHEMICAL PROTECTIVE CMU-34/P, SIZE 48	1	
	8415-01-490-1915	. UNDERSHIRT, CHEMICAL PROTECTIVE CMU-34/P, SIZE 50	1	
	8415-01-490-1917	. UNDERSHIRT, CHEMICAL PROTECTIVE CMU-34/P, SIZE 52	1	
-2	8415-01-490-4368	. DRAWERS, CHEMICAL PROTECTIVE CMU-35/P, SIZE 26	1	
	8415-01-490-4371	. DRAWERS, CHEMICAL PROTECTIVE CMU-35/P, SIZE 28	1	
	8415-01-490-4372	. DRAWERS, CHEMICAL PROTECTIVE CMU-35/P, SIZE 30	1	
	8415-01-490-4374	. DRAWERS, CHEMICAL PROTECTIVE CMU-35/P, SIZE 32	1	
	8415-01-490-4376	. DRAWERS, CHEMICAL PROTECTIVE CMU-35/P, SIZE 34	1	
	8415-01-490-4378	. DRAWERS, CHEMICAL PROTECTIVE CMU-35/P, SIZE 36	1	
	8415-01-490-4379	. DRAWERS, CHEMICAL PROTECTIVE CMU-35/P, SIZE 38	1	
	8415-01-490-4380	. DRAWERS, CHEMICAL PROTECTIVE CMU-35/P, SIZE 40	1	
	8415-01-490-4381	. DRAWERS, CHEMICAL PROTECTIVE CMU-35/P, SIZE 42	1	
	8415-01-490-4382	. DRAWERS, CHEMICAL PROTECTIVE CMU-35/P, SIZE 44	1	
	8415-01-490-4383	. DRAWERS, CHEMICAL PROTECTIVE CMU-35/P, SIZE 46	1	
	8415-01-490-4384	. DRAWERS, CHEMICAL PROTECTIVE CMU-35/P, SIZE 48	1	

NUMERICAL INDEX

Part Number	Figure and Index Number	SM&R Code
-------------	----------------------------	--------------

8415-01-040-3169	5A-2-3	PAOZZ
8415-01-040-9018	5A-2-5	PAOZZ
8415-01-138-2494	5A-2-7	PAOZZ
8415-01-138-2495	5A-2-7	PAOZZ
8415-01-138-2496	5A-2-7	PAOZZ
8415-01-138-2501	5A-2-6	PAOZZ
8415-01-138-2502	5A-2-6	PAOZZ
8415-01-138-2503	5A-2-6	PAOZZ
8415-01-138-2504	5A-2-6	PAOZZ
8415-01-490-1900	5A-2-1	PAOZZ
8415-01-490-1901	5A-2-1	PAOZZ
8415-01-490-1902	5A-2-1	PAOZZ
8415-01-490-1903	5A-2-1	PAOZZ
8415-01-490-1904	5A-2-1	PAOZZ
8415-01-490-1908	5A-2-1	PAOZZ
8415-01-490-1910	5A-2-1	PAOZZ
8415-01-490-1911	5A-2-1	PAOZZ
8415-01-490-1913	5A-2-1	PAOZZ

Part Number	Figure and Index Number	SM&R Code
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8415-01-490-1914	5A-2-1	PAOZZ
8415-01-490-1915	5A-2-1	PAOZZ
8415-01-490-1917	5A-2-1	PAOZZ
8415-01-490-4368	5A-2-2	PAOZZ
8415-01-490-4371	5A-2-2	PAOZZ
8415-01-490-4372	5A-2-2	PAOZZ
8415-01-490-4374	5A-2-2	PAOZZ
8415-01-490-4376	5A-2-2	PAOZZ
8415-01-490-4378	5A-2-2	PAOZZ
8415-01-490-4379	5A-2-2	PAOZZ
8415-01-490-4380	5A-2-2	PAOZZ
8415-01-490-4381	5A-2-2	PAOZZ
8415-01-490-4382	5A-2-2	PAOZZ
8415-01-490-4383	5A-2-2	PAOZZ
8415-01-490-4384	5A-2-2	PAOZZ
8430-00-580-1205	5A-2-4	PAOZZ
8430-00-580-1206	5A-2-4	PAOZZ
8430-00-591-1359	5A-2-4	PAOZZ

CHAPTER 6

BATTERY PACKS

Section 6-1. Introduction

6-1. GENERAL.

6-2. Two battery chemistries have been authorized for use with Pusher Fan (P/N 3297AS600-1): the rechargeable NiCad (P/N 3297AS601-1) and the non-rechargeable Lithium Manganese Dioxide (LiMnO₂) (P/N 3297AS601-2) battery packs. The batteries' comparative specifications are listed in [table 6-1](#).

6-3. INTENDED USE.

6-4. The non-rechargeable lithium battery is intended for use during operational contingency missions and

the rechargeable NiCad battery is used for training missions. The non-rechargeable Lithium Manganese Dioxide battery pack is designed to provide electrical power to the Pusher Fan (P/N 3297AS600-1) for approximately 12+ hours at room temperature. The NiCad battery has an operational service life of 3 to 4 hours. If NiCad batteries are not available for proficiency training, Lithium batteries may be used on a limited basis until NiCad batteries are available. In an emergency situation, NiCad batteries may be used for contingency missions, however, the reduced service life must be considered. Aircrewmembers will always carry at least one spare battery, or more depending on mission duration.

Table 6-1. Battery Specifications

	Lithium Manganese Dioxide	NiCad
Chemistry:	Lithium Manganese Dioxide	Nickel Cadmium
Part No:	3297AS601-2	3297AS601-1
Mfg. P/N:	520-03-94	520-03-16
Type:	Non-rechargeable/Disposable	Rechargeable
Color:	Green	Black
Fuse:	Internal (non-replaceable)	Replaceable, 2A @ 250 V Racal P/N 521-01-38
Shelf Life:	10 yrs	7 years
Service Life:	12 hrs. (continuous use)	3-4 hrs. (continuous use) 2 yrs. (1000 cycles)
Storage Temp: (Optimum)	32°F to 85°F	32°F to 85°F
Cells:	(2) D cells	(4) 1/2 D Cells
Cell Voltage:	3V nominal	1.2V nominal
Battery OCV:	6 - 6.4 Vdc	4.8 - 5.5 Vdc
Weight:	15 oz.	18 oz.
Capacity:	10 Ahr @ ambient temp	2.3 Ahr @ ambient temp
Op. Temp:	-40°F to 160°F	-4°F to 160°F

Section 6-2. Rechargeable NiCad Battery Pack

6-5. DESCRIPTION.

6-6. The battery pack (figure 6-1) is a Nickel Cadmium type electrical power supply.

6-7. OPERATION.

6-8. The battery pack is designed to provide electrical power to the pusher fan (3M P/N 025-00-02) for approximately 3 1/2 to 4 hours at moderate temperatures. Each battery provides 500 to 750 charge/discharge cycles. However, the life of the battery will be significantly reduced when they are exposed to high heat over an extended period of time.

6-9. INSPECTIONS.

NOTE

Only batteries that are currently in use need to be inspected and charged. Batteries placed in storage do not need to be inspected or periodically recharged.

6-10. PLACE-IN-SERVICE INSPECTION. The battery pack Place-In-Service Inspection shall include unpacking, Visual Inspection, Functional Check, discharging, charging and storage. All Place-In-Service Inspections shall be performed at the Organizational Maintenance Level.

6-11. Remove the battery from its packing case.

6-12. Visual Inspection. The following components shall be visually inspected as part of the Place-In-Service Inspection. After completing the inspection, fill out a Quality Deficiency Report (QDR) on the battery pack and forward to the Naval Air Warfare Center, Aircraft Division, (NAWC-AD) Code 4.6.3.1, NAS Patuxent River, MD 20670-5304, if any of the following problems are apparent:

NOTE

Do not forward or dispose of battery until disposition instructions are provided by the Naval Air Warfare Center, Aircraft Division, Patuxent River.

1. Battery pack case appears swollen or cracked.

2. Battery pack leaks fluid or substance of any kind.

3. Battery pack 3-pin receptacle has become corroded, cracked or damaged.

4. Battery pack case contaminated with oil, grease or other matter.

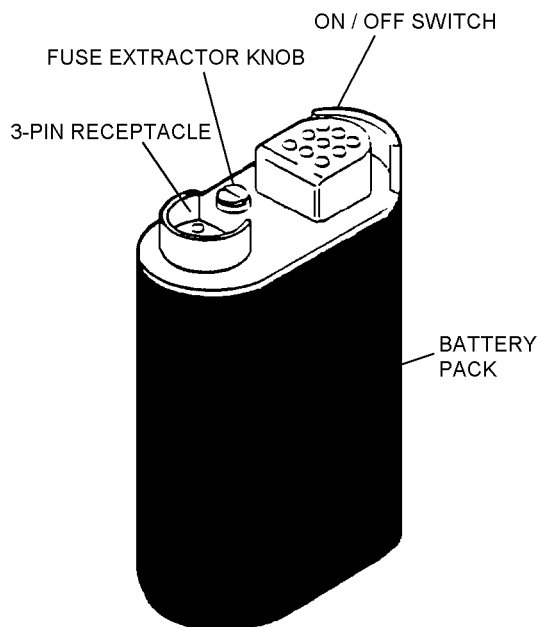


Figure 6-1. Rechargeable NiCad Battery Pack

6-1

5. ON/OFF push switch rubber cover is damaged or missing.

6. Fuse extractor knob is missing.

7. Fuse is missing.

8. Battery pack labels are missing.

6-13. Functional Check.

1. Plug a pusher fan cord into the battery pack 3-pin receptacle.

2. The battery pack is operated by a push button ON/OFF switch located in the top of the unit. Push once for ON or OFF depending on the switch's initial position.

3. Turn the battery pack ON/OFF switch to the ON position.

4. Should the battery pack fail to produce output, try a new pusher fan. If the battery pack still fails to produce output, see Troubleshooting, [table 6-2](#).

NOTE

Do not use the power cord to pull plug from the battery pack. Do not apply undue stress to the cord or carry the battery pack by the cord.

5. Switch battery pack OFF and unplug pusher fan from battery pack.

CAUTION

Running the batteries down completely (less than one volt output) or “deep discharging”

will damage the battery cells and will not improve the charge capacity.

6-14. Discharging Battery Pack. New batteries or batteries in use do not need to be fully discharged prior to charging. Batteries may be charged at any time during the discharge cycle. Voltage depression (a.k.a. “memory”) caused by repeated incomplete discharge cycles is not a significant factor for these 3M batteries. Allowing a battery to self-discharge during extended storage will not harm the battery. Batteries subjected to prolonged storage (longer than 12 months) may lose their capacity to hold a full charge. Checking the battery capacity can be accomplished by running a pusher fan, without filter, for approximately three and one half hours, using caution not to fully discharge the battery, and then checking that the required airflow is maintained. Several charge, discharge, and charge cycles may restore battery capacity. A battery can be discharged by running a pusher fan, without filter, for approximately three and one half hours, using caution not to fully discharge the battery.

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WARNING

When charging battery packs on the 10-unit charger, charge only in well ventilated and non-hazardous locations, and avoid any type of moisture. Failure to do so may expose the user to serious bodily injury.

CAUTION

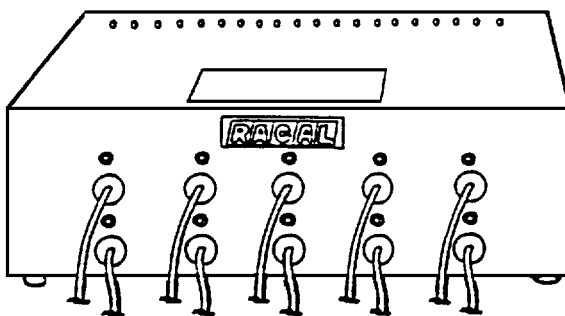
Always charge 3M batteries at a temperature of 77° F (25° C) or less. At higher temperatures, the battery may not accept a full charge. If a battery feels hot, let it cool one half hour at 77° F (25° C) or less before charging. Continuous charging generates heat that deteriorates NiCad batteries.

6-15. Charging the Battery Pack. New batteries or batteries in use do not need to be fully discharged prior to charging. Batteries may be charged any time during the discharge cycle. Keep a log of battery use time along with monitoring the air flow from the pusher fan to determine when batteries need to be charged.

6-16. Battery packs shall be charged on the 10-unit BCU-30/E charger (3M, telephone 651-736-3404 or 800-243-4630 P/N 520-01-61) ([figure 6-2](#)) as follows:

1. Place the charging station horizontally on a flat surface and plug the station AC power cord into a 120 V 60 Hz outlet. The green LED light for each channel will turn on.

2. Insert a charging lead into each battery pack. The LED for channel will turn off, indicating that the battery pack attached to that channel is being charged in a High Rate mode. After a period of time, the LED light will turn back on. This indicates that the charging station has detected a fully charged battery pack and has switched to a Trickle Rate mode, preventing the battery pack from going into overcharge.



6-2

Figure 6-2. 10-Unit BCU-30/E Charger

3. The battery pack requires approximately 3 to 3 1/2 hours to fully charge after being fully discharged.

NOTE

Do not charge a battery continuously for more than one week.

4. To determine that a battery pack has been fully charged you may monitor the charging process by observing the LED. A fully discharged battery pack should charge for 3 to 3 1/2 hours before the LED turns on. If the LED turns on prematurely, see [paragraph 6-30](#).

5. Record the charge date on the date label affixed to the back side of the battery pack after removing from charger.

6-17. Storage. The life of the batteries will be significantly reduced when they are exposed to high heat over an extended period of time. Batteries placed in storage do not need to be inspected or periodically recharged. Allowing a battery to self-discharge during extended storage will not harm the battery.

1. Battery packs should be stored in a cool, dry environment with optimum temperatures ranging from 32°F to 75°F.

NOTE

Battery packs self discharge at a rate of approximately 1% per day. Higher storage temperature will accelerate this rate.

2. Ensure charge date has been recorded on the label affixed to the back of the battery pack.

6-18. PREFLIGHT INSPECTION.

6-19. Visual Inspection. The following battery pack components shall be visually inspected as part of the Preflight Inspection ([figure 6-1](#)). Perform the Visual Inspection as described in [paragraph 6-12, steps 1 through 8](#).

NOTE

Rotate battery pack stocks to ensure all battery packs are used, i.e. first in storage first out.

Allow battery packs that have been recently charged to sit for approximately 20 minutes before being used.

6-20. Functional Check. Before a battery pack is used for flight, check the date on the battery pack label and ensure that it has been charged within the last month. If not, charge in accordance with [paragraph 6-15](#).

6-21. Perform Functional Check procedure in accordance with [paragraph 6-13](#).

6-22. POSTFLIGHT INSPECTION.

6-23. Visual Inspection. Perform Visual Inspection in accordance with [paragraph 6-12, steps 1 through 8](#).

6-24. Charging the Battery Pack.

NOTE

It is not necessary to charge a battery pack if it was not used in-flight. Unused battery packs shall be stored in accordance with [paragraph 6-17](#).

6-25. Battery packs that are fully or partially expended during flight shall be charged on the 10-unit Charger ([figure 6-2](#)) in accordance with [paragraph 6-15](#).

6-26. SPECIAL INSPECTION. A Special Inspection shall be performed on the battery packs every 30 days. The Special Inspection shall consist of visual inspection, charging and storage.

6-27. Visual Inspection. Perform Visual Inspection in accordance with [paragraph 6-12, steps 1 through 8](#).

NOTE

Ensure the date label is securely attached to the back of the battery pack. If the label is loose, missing or filled up, replace with a new label.

6-28. Charging the Battery Pack. Check the date on the battery packs in storage. If a battery pack has been on the shelf for more than 1 month, place it on the 10-unit charger and charge in accordance with [paragraph 6-15](#).

WARNING

When charging battery packs on the 10-unit charger, charge only in well ventilated and non-hazardous locations, and avoid any type of moisture. Failure to do so may expose the user to serious bodily injury.

6-29. Storage. Battery packs shall be stored (in a fully charged state) for no longer than one month before being placed in service. A battery pack stored for longer than 1 month should be placed on a 10-unit charger and charged in accordance with [paragraph 6-15](#).

1. Battery packs should be stored in a cool, dry environment with optimum temperatures ranging from 32°F to 75°F.

NOTE

Battery packs self discharge at a rate of approximately 1% per day. Higher storage temperature will accelerate this rate.

2. Ensure charge date has been recorded on the label affixed to the back of the battery pack.

6-30. TROUBLESHOOTING.

6-31. Troubleshooting shall be performed in accordance with procedures listed in [table 6-2](#).

Table 6-2. Troubleshooting

Trouble	Probable Cause	Remedy
Battery does not power pusher fan or provide voltage output.	Power cord is not securely attached to battery pack 3-pin connector.	Ensure that pusher fan power cord is securely attached to the 3-pin connector on the battery pack.
	Blown fuse.	<p>Using a thin flat blade screwdriver, press down on the fuse extractor knob and twist a quarter of a turn (See figure 6-3). Pull the knob out and insert a 2 amp fuse (3M P/N 521-01-38) into the knob. Replace the O-ring (3M P/N 529-02-41R10) if damaged. Insert the fuse and knob back into the battery pack.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;">CAUTION</div> <p>Use (exclusively) 3M (P/N 521-01-38) replacement fuses in battery packs. Other than fuse replacement, no other dismantling or repair of the battery packs should be attempted.</p>
	Faulty power cord or corrosion on 3-pin plug.	Replace cord
	Battery pack not charged.	<p>Charge battery pack in accordance with paragraph 6-15. If after charging the battery pack between 3 to 3 1/2 hours, it still does not power a pusher fan, dispose of battery pack.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;">WARNING</div> <p>Battery packs should not be discarded in the trash. All battery packs that are damaged or exceed their service life shall be disposed of in accordance with paragraph 6-32.</p>
10-unit charging station LED does not turn on when plugged into 120 V 60 Hz outlet.	Blown AC fuse on back of 10-unit charging station.	Replace blown fuse with a 3 amp 3M (P/N 521-01-87) fuse.

Table 6-2. Troubleshooting (Cont)

Trouble	Probable Cause	Remedy
10-unit charging station LED does not turn off when connected to a battery pack.	Fault in battery pack.	Check the fuse in the battery pack as previously mentioned above.
10-unit charging station LED turns on prematurely for a fully discharged battery pack in less than three hours.	Fault in battery pack or charging station.	Unplug battery pack from the charging station for several minutes and then plug battery pack back into the charging station. If the problem continues try a different battery pack on the same charging station port to determine if the problem is in the battery pack or the charging station.

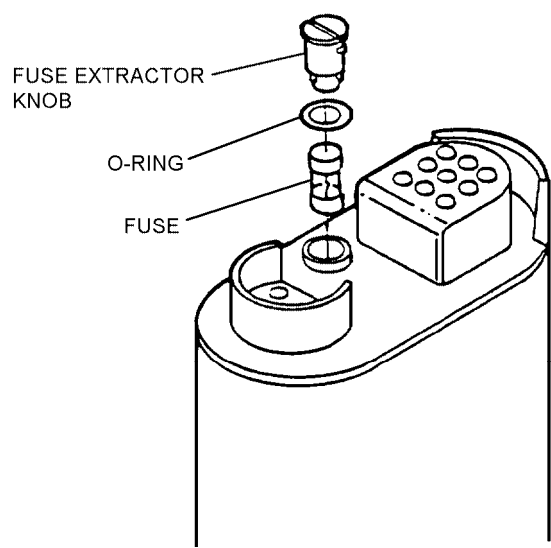


Figure 6-3. Battery Pack Fuse Replacement⁶⁻³
NOTE

No dismantling of either the battery pack or charging station should be attempted. If a problem continues after the troubleshooting procedures have been performed, a Quality Deficiency Report (QDR) will be submitted and the defective battery pack or charging station shall be shipped with the QDR to the Naval Air Warfare Center, Aircraft Division, (NAWC-AD) Code 4.6.3.1, NAS Patuxent River, MD 20670-5304.

6-32. DISPOSAL.

6-33. AT SEA. Routine disposal of batteries is prohibited per 40CFR 220 Sub Chap H. Store defective

batteries in a separate cool, dry area away from other combustible material until ashore.

6-34. ASHORE. Dispose of batteries as follows:

1. Turn into the local Defense Reutilization and Marketing Office (DRMO) in accordance with Chapter II of OPNAVINST 5090.1 for disposal as a hazardous waste. Before initiating a NiCad battery disposal system, consult the local DRMO and military environmental protection branch to coordinate battery information, packaging, quantities, labeling, shipping, and tracking requirements.
2. If the local DRMO will not accept the batteries, contact the local military environmental branch for disposal of hazardous waste.
3. Under certain emergency conditions, if batteries are deemed to be too hazardous for routine disposal, Explosive Ordnance Disposal (EOD) shall be contacted for immediate removal to a safe site.
4. Questions or problems regarding the packaging, transportation, labeling, storage, tracking, or contract requirements of NiCad batteries for disposal should be addressed to:

Naval Ordnance Center (NOC) Code N713
Farragut Hall, Bldg. D-323
23 Strauss Avenue
Indian Head, MD 20640-5555

Section 6-3. Non-Rechargeable Lithium Manganese Dioxide Battery Pack

6-35. DESCRIPTION.

6-36. The Lithium Manganese Dioxide (LiMnO_2) battery pack, P/N 3297AS601-2, is a green non-rechargeable battery that contains two D size cells wired in series. It will power the Pusher Fan (P/N 3297AS600-1) for 12+ hours at room temperature. The battery incorporates several internal safety features: an electrical line fuse (in case of an external short circuit), blocking diode (to prevent inadvertent charging), thermal fuse/switch (to protect against excessive heating) and a designed vent path. The battery has recently been qualified by NAWC-Crane for use with the Pusher Fan and is being procured under contract N00019-94-C-0080. See [figure 6-4](#).

6-37. OPERATION.

6-38. The Lithium battery is operated by depressing the push button On/Off switch located on the top of the battery. Plug a pusher fan cord into the battery's 3-pin receptacle ([figure 6-4](#)). Push once for On or Off, depending on the switch's initial position. Should the battery fail to produce output from the pusher fan, try a new pusher fan. If the battery still fails to power the pusher fan, fill out a Quality Deficiency Report (QDR) on the battery and forward to the Naval Air Warfare Center, Aircraft Division, Code 4.6.3.1, NAS Patuxent River, MD 20670-5304.

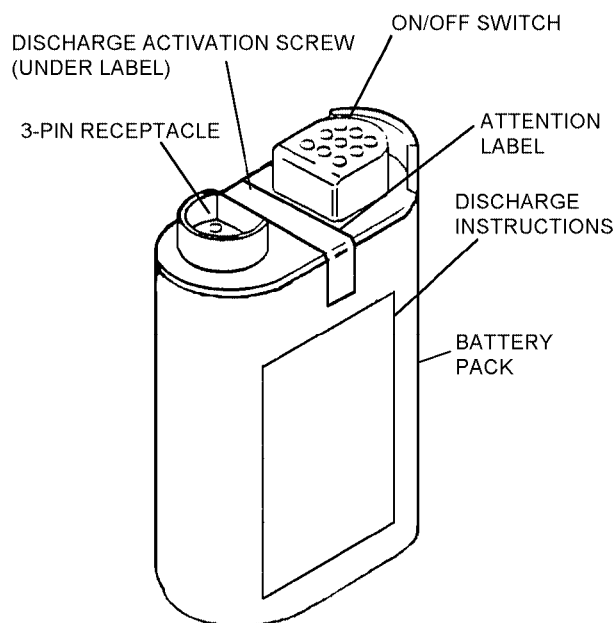


Figure 6-4. Lithium Manganese Dioxide Battery

6-4

6-39. INSPECTIONS.

6-40. Inspections shall include: Place-in-Service, Preflight and Postflight. Special inspections are not required.

6-41. PLACE-IN-SERVICE. Place-in-Service Inspection shall consist of unpacking, visual inspection, functional check and short term storage.

6-42. Unpacking. There are no special instructions for unpacking new Lithium batteries. Once unpacked, however, check to make sure that the ATTENTION label is affixed to the top of the Lithium battery. This label hides the discharge screw that is beneath it.

6-43. Visual Inspection. The following battery components shall be visually inspected: battery case (for cracks or leaks), 3-pin receptacle (for corrosion or cracks), On/Off switch (for damage to rubber), and labels (front and back) ([figure 6-4](#)).

6-44. Functional Check. Functional check shall consist of plugging a Pusher Fan cord into the battery pack 3-pin receptacle and switching the battery On. If the battery pack fails to produce output, try a new Pusher Fan.

6-45. Short Term Storage. Battery packs that pass the visual inspection and functional check shall be placed in short term storage (on-the-shelf) for near term use.

NOTE

If the battery fails the visual inspection or functional check, fill out a Quality Deficiency Report (QDR) on the battery and forward to the Naval Air Warfare Center, Aircraft Division, Code 4.6.3.1, NAS Patuxent River, MD 20670-5304.

6-46. PREFLIGHT. Preflight Inspection shall consist of a visual inspection and functional check.

6-47. Visual Inspection. Perform visual inspection in accordance with [paragraph 6-43](#).

6-48. Functional Check. Before a battery pack is used for flight, check the hours remaining on the battery pack label (back of battery). Ensure that there is ample time remaining for the intended flight. If not, choose another battery (with ample time) from short

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term storage. If there are none available, draw a new battery from long term storage.

6-49. POSTFLIGHT. Postflight Inspection shall consist of a visual inspection and functional check.

6-50. Visual Inspection. Perform visual inspection in accordance with [paragraph 6-43](#).

6-51. Functional Check. Strike through the hours used from flight on the label on the back of the battery. If there are not enough hours remaining for another flight, deactivate and dispose of the battery in accordance with [paragraph 6-54](#). If there are hours remaining, place in short term storage for future use.

6-52. LONG TERM STORAGE.

6-53. Lithium batteries shall be stored in a cool, dry environment with optimum temperatures ranging from 32°F to 85°F. Storage areas shall conform to the requirements specified in the latest revision of NAVSEAINST 9310 for LiMnO₂ chemistry.

6-54. DISPOSAL.

6-55. Lithium batteries ([figure 6-4](#)) shall be fully discharged in accordance with the instruction label on the front of the battery pack prior to disposal or for storage awaiting disposal.

6-56. AT SEA. Routine disposal of batteries is prohibited per 40CFR 220 Sub Chap H. Store used bat-

teries in a separate cool, dry area away from other combustible material until ashore.

6-57. ASHORE. Dispose of batteries as follows:

1. Turn into the local Defense Reutilization and Marketing Office (DRMO) in accordance with Chapter II of OPNAVINST 5090.1 for disposal as a hazardous waste. Before initiating a lithium battery disposal system, consult the local DRMO and military environmental protection branch to coordinate battery information, packaging, quantities, labeling, shipping, and tracking requirements.

2. If the local DRMO will not accept the batteries, contact the local military environmental branch for disposal of hazardous waste.

3. Under certain emergency conditions, if batteries are deemed to be too hazardous for routine disposal, Explosive Ordnance Disposal (EOD) shall be contacted for immediate removal to a safe site.

4. Questions or problems regarding the packaging, transportation, labeling, storage, tracking, or contract requirements of lithium batteries for disposal should be addressed to:

Naval Ordnance Center (NOC) Code N713
Farragut Hall, Bldg. D-323
23 Strauss Avenue
Indian Head, MD 20640-5555

CHAPTER 7

CARTRIDGE ACTUATED CUTTER

Section 7-1. Description

7-1. GENERAL.

7-2. The Cartridge Actuated Cutter (NSN 1377-01-492-4305) (figure 7-1) is commonly known as the Passive Anti-Suffocation Device (PASD). It is a battery operated, cartridge actuated device used to provide a breathing air passage for an unconscious aircrewmember forced down over water while wearing an A/P22P-14(V) Chemical Protective Respirator Assembly.

7-3. APPLICATION.

7-4. The Cartridge Actuated Cutter is intended for use with the A/P22P-14(V)2 or (V)3 during operational contingency missions.

7-5. OPERATION.

7-6. The Cartridge Actuated Cutter is mounted on the mask inlet hose of the respirator. When properly installed, the Cartridge Actuated Cutter will open a one-half inch hole in the respirator's mask inlet hose above the water line after it enters and exits fresh or salt water. This will provide ambient air for breathing to the pilot even though the end of the hose may still be immersed. The device is fully automatic and does not require aircrewmember or aircraft input for activation. It is further capable of sustaining a dormant condition when exposed to all environmental stimuli except complete immersion in fresh or salt water. After immersion it will function only upon removal from the water. The Cartridge Actuated Cutter has a firing indicator device built into the clamp assembly that will display a red flag to indicate an expended unit. The red flag is visible to the aircrewmember

while wearing the Cartridge Actuated Cutter. Table 7-1 provides leading design parameters.

7-7. The Cartridge Actuated Cutter has been classified as "Not Regulated" by the U.S. Department of Transportation, Classification of Explosives, in accordance with Section 173.56, Title 49, Code of Federal Regulations, (49 CFR). The United Nations Committee of Exports on Transportation of Dangerous Goods has assigned a U. N. Number of UN0000 to the Cartridge Actuated Cutter. This means there are no special handling, storage, shipping or marking procedures applicable to the limited quantity of explosives contained in this device. The device contains a 181-milligram charge and presents no significant hazard in the event of ignition or initiation during transport. A Material Safety Data Sheet is available for this device and should always accompany the Cartridge Actuated Cutter as a safety reference during handling, storage and shipping of the device.

Table 7-1. Leading Particulars

Overall Dimensions	
Length	2 7/16 inches
Width	1 7/16 inches
Height	2 1/2 inches
Weight	65 grams
Service Life	5 years
Operating Temperature	0 to 125 degrees Fahrenheit
Transportation	Per UN0000 Package Instruction 134

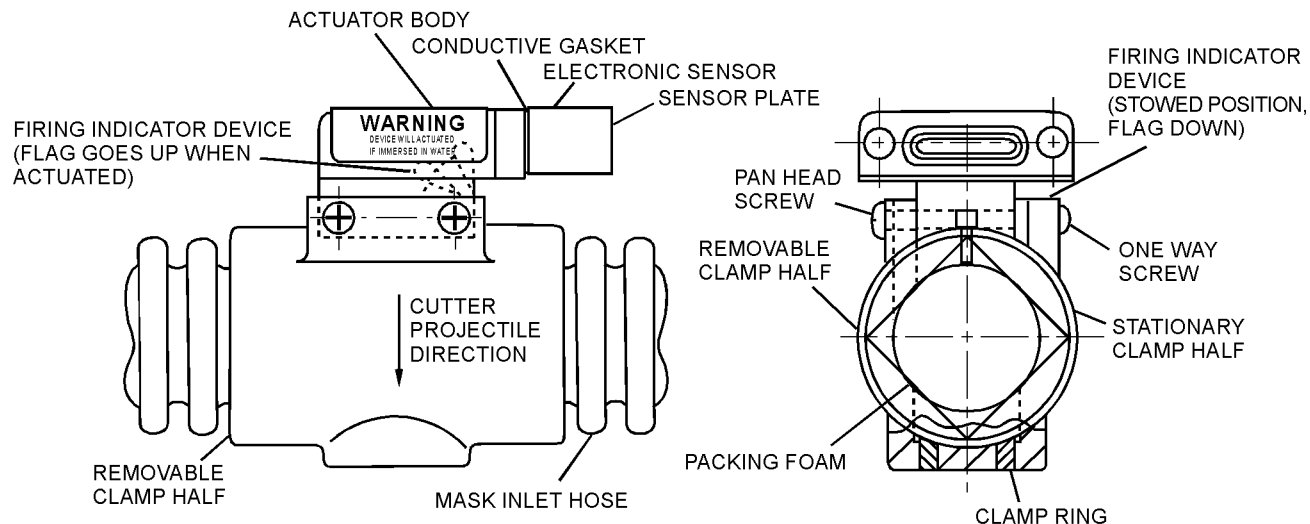


Figure 7-1. Cartridge Actuated Cutter

007001

Section 7-2. Modifications

7-8. GENERAL.

7-9. There are no modifications to the Cartridge Actuated Cutter authorized at this time.

Section 7-3. Installation

7-10. GENERAL.

WARNING

The Cartridge Actuated Cutter is an electro-explosive device that employs a cutter to penetrate the Mask Inlet Hose. If the foam-packing insert is removed and the clamp is opened, the open clamp end, which contains the cutter, shall not be pointed towards personnel or equipment. The cutter is a projectile when clamp is open and in case of inadvertent firing, can inflict personal injury and/or equipment damage. The device will be assembled on the Mask Inlet Hose immediately after packing foam and clamp are removed.

Do not immerse the Cartridge Actuated Cutter in water, emergence from the water and exposure to air will activate the device.

CAUTION

Adhere to all maintenance requirements and safety precautions contained in applicable MIMs.

7-11. INSTALLATION PROCEDURE.

7-12. Installation of the Cartridge Actuated Cutter shall be performed as following:

1. Open and inspect the Respirator in accordance with the instructions contained in [Chapter 4](#).

2. Select a clean, dry, flat, work surface for installation. Lay the Respirator flat with faceplate/mask facing up and the hoses towards the installer.

CAUTION

When removing the Cartridge Actuated Cutter from the container, do not remove the packaging foam located inside the hose clamp until just prior to installation.

3. Remove the Cartridge Actuated Cutter from the container. Place the device on the work surface and review figure 7-1 to identify and orient components of the Cutter.

4. Inspect the firing indicator device on the Cartridge Actuated Cutter to insure that the unit has not been actuated. Orient the device as shown in figure 7-2. The red flag is contained in a slot below the serial number and behind the one-way screw on the left. The red flag should be in the down position or stowed within the confines of the slot. If the red flag is in the up position, as shown in figure 7-2, device has been actuated and cannot be installed. If the red flag is up, initiate a QDR and return the unit to:

NAWCAD

CBR Lab/Code 4.6.3.1/Bldg 2187/Suite 2240A
48110 Shaw Rd.

Patuxent River, MD 20670-1906.

5. Position the Cartridge Actuated Cutter on a flat surface with the warning label and pan head screws up, and the Actuator Body towards the installer. Remove the two pan head screws with a Phillips head screwdriver. Slide the removable clamp half away from the actuator body to disengage from the clamp ring. Remove the removable clamp half from the stationary clamp half. Discard the packaging foam, set the removable clamp half aside.

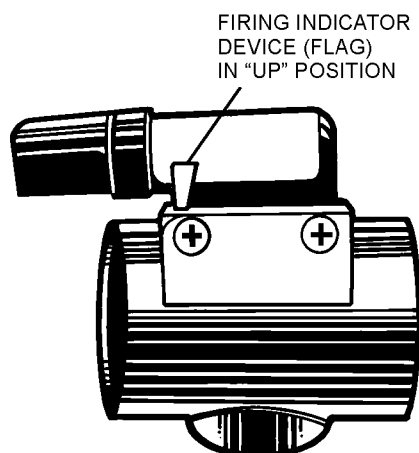


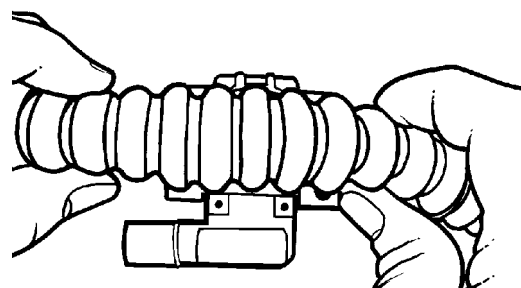
Figure 7-2. Firing Indicator Device In Up Position

WARNING

With the clamp half and shipping foam removed, the cutter can become a projectile if inadvertently actuated. The Cutter should always be pointed away from the installer and any other person in the area.

6. The Cartridge Actuated Cutter will be installed on the mask inlet hose. The mask inlet hose is the hose on the right or the larger of the two hoses. The Cartridge Actuated Cutter will cover five convolutes starting at the fourth convolute below the anti-suffocation disconnect (figure 7-3).

7. Place the stationary clamp half on right side of the mask inlet hose with actuator body on the right, and the electronic sensor towards the installer. Gently stretch the hose, and starting with fourth convolute below the anti-suffocation disconnect, place the hose into the clamp. Insure 5 hose convolutes are fitted into the matching indentations molded into the clamp.



Step 7 - Para 7-12

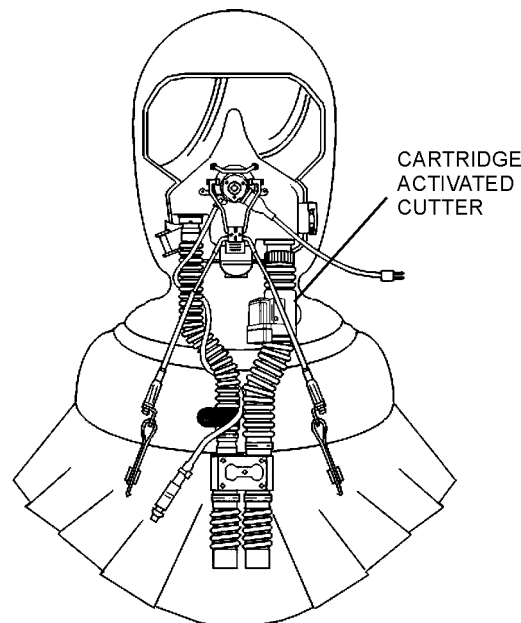
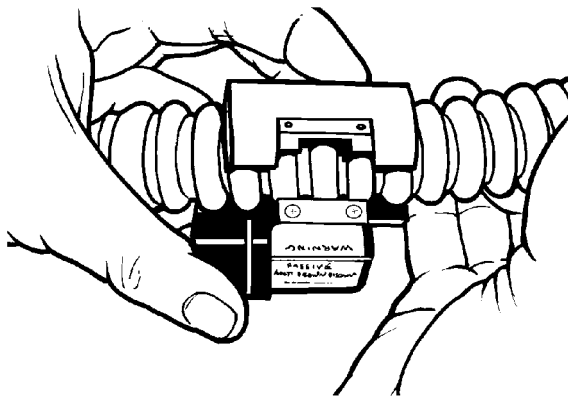


Figure 7-3. Respirator Assembly

8. Hold the hose stationary, keeping the 5 hose convolutes in place, rotate/move the stationary clamp half counterclockwise (to the left) so the actuator body is between 20 and 45 degrees to the left of the top center of the hose. Using the top center of the hose as twelve o'clock, the actuator body should be between the nine and eleven o'clock positions. Placing the actuator in this position will maximize the probability of the wearer viewing the firing device indicator (flag) in the event of an inadvertent actuation.

9. Attach the removable clamp half to the hose by lining it up with the two pegs on the clamp ring and rotating the clamp into the actuator body. Insure the 5 hose convolutes match the indentations molded in the removable clamp half. Re-install pan head screws and tighten sufficiently to hold the Cartridge Actuated Cutter in place, but loose enough to rotate the device if required.



7p012s9

Step 9 - Para 7-12

10. With the Respirator laying flat on the table and the faceplate/mask facing up, examine the position of Cartridge Actuated Cutter in relation to the top of the hose. Looking from the end of the mask inlet hose, and using the top of the hose as twelve o'clock, the actuator body should be between the nine and eleven o'clock positions. Adjust/rotate the device as required and securely tighten pan head screws.

11. Prepare Respirator for storage in accordance with the instructions contained in [paragraph 4-101](#).

Section 7-4. Maintenance

7-13. GENERAL.

7-14. Maintenance is limited to inspection and cleaning. The surface of the actuator body gasket and the sensor plate as shown in [Figure 7-1](#) are conductive surfaces required for completing an electrical path to provide proper functioning of the Cartridge Actuated Cutter during immersion. These surfaces shall be kept clean at all times.

7-15. INSPECTION.

NOTE

Only Cartridge Actuated Cutters that are installed on the respirator assembly need to be inspected.

7-16. Inspection is limited to visual inspection. No functional checks for the Cartridge Actuated Cutter or its battery are required. The Cartridge Actuated Cutter shall be inspected at intervals coinciding with respirator assembly inspections stated in [Chapter 4](#). Visually inspect the Cartridge Actuated Cutter. Cartridge Actuated Cutters with the following observations shall be returned to NAWCADPAX and replaced.

1. If the red firing indicator flag is in the up position, as shown in [figure 7-2](#).
2. Cutter has reached its shelf life.
3. Physical damage such as cracks or dents.
4. Missing labels or screws.

7-17. CLEANING.

7-18. The surface of the actuator body gasket and the sensor plate may be cleaned using a dry cloth or non-metallic brush. Do not use metal tools, water, or solvents to clean surfaces. Cleaning of the sensor plate is not recommended because of possible grounding, which will result in actuation. During mask/hose cleaning (or decontamination) the Cartridge Actuated Cutter must be removed from the hose to prevent inadvertent actuation.

7-19. STORAGE.

7-20. The Cartridge Actuated Device is not an Electro-static Sensitive Device (ESD), but should be stored in an anti-static bag and in a dry environment at a temperature within the range of 40°F (5°C) to 90°F (32°C).

7-21. SHELF LIFE AND OPERATIONAL LIFE.

7-22. The maximum recommended shelf life and operational life of the Cartridge Actuated Cutter is five years.

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CHAPTER 8

CB HEAD HARNESS P/N 1774AS601-20

Section 8-1. Description

8-1. GENERAL.

8-2. The CB Head Harness (P/N 1774AS601-20) (figure 8-1) is a fabricated assembly that serves as a solution for non-helmeted mask retention. It is used with the A/P22P-14(V) Chemical Protective Respirator Assembly. The CB Head Harness is a fully adjustable webbing system that is worn on the head. One size can accommodate all head sizes.

helmet, the CB Head Harness may be used as an alternative for mask retention. Proper mask retention is required to ensure safe breathing operation and to maximize field of view. The CB Head Harness is donned along with the respirator assembly and is connected to the respirator's mask retention straps. When properly fitted and adjusted, the CB Head Harness comfortably accommodates any aviator without adversely affecting hearing performance.

8-3. CONFIGURATION.

8-4. The CB Head Harness is a webbing and hardware assembly. Adjustable head and nape straps allow it to be fully adjustable. The CB Head Harness can be fabricated at any fleet level maintenance shop. When there are no other requirements for the aircrew

8-5. APPLICATION.

8-6. The CB Head Harness is intended for use by non-helmeted patrol/cargo aircrewmembers equipped with the A/P22P-14(V) Series Respirator Assembly who are operating P-3, C-130, C-9, C-20, and C-40 aircraft.

Section 8-2. Modifications

8-7. GENERAL.

8-8. There are no modifications authorized for the CB Head Harness.

Section 8-3. Fitting and Donning

8-9. FITTING OF CB HEAD HARNESS.

8-10. The CB Head Harness is designed to fit all head sizes. By adjusting the webbing and buckles, the head harness may be adapted to accommodate any aircrewmember. To fit the CB Head Harness, proceed as follows:

1. The aircrewmember should don the A/P22P-14(V) respirator assembly.

2. Place the head harness on the back of the head over the respirator hood with the hook and pile fastener on the top and the webbing and buckles across the back of the neck.

3. The side panels should go over the ears and the top hook and pile fastener should be undone.

4. Snap the mask retention straps to the head harness and ensure the toggle harness terminals are in the shortest position.

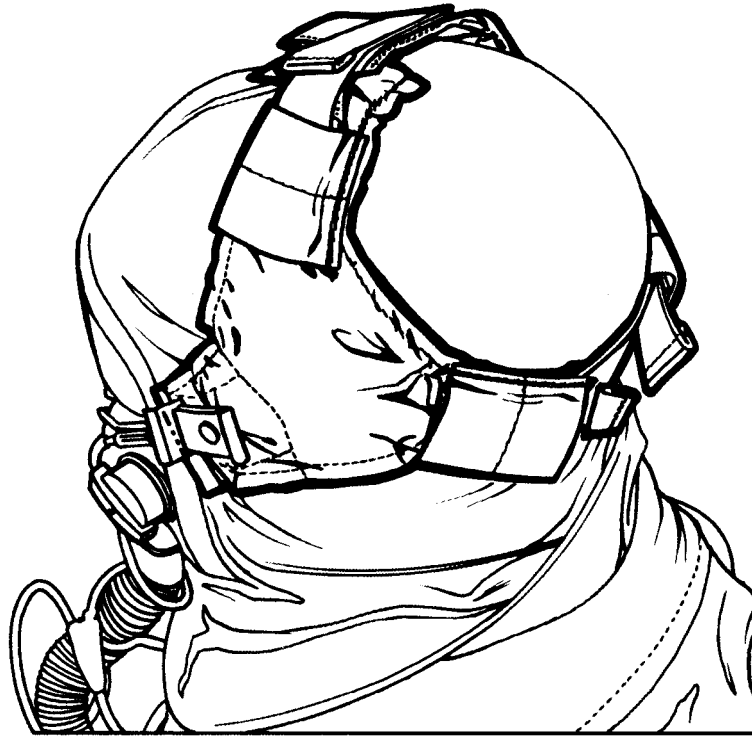


Figure 8-1. CB Head Harness

008001

5. The V bow should be in the down position.
6. Adjust hook and pile fastener on top of head for comfortable fit.
7. Tighten the webbing behind the neck until there is a good seal around the oral nasal mask. Mark the position around the buckles. Remove the head harness.
8. Double the webbing back through the buckles and tack the straps in place with size E thread.

8-11. DONNING PROCEDURES WITH CB HEAD HARNESS.

8-12. Donning procedures of the Respirator Assembly if using the CB Head Harness shall be in accordance

with the instructions contained in paragraph 5A-27, except that the CB Head Harness is used in lieu of the aircrew helmet. Unique head harness donning procedures include:

1. Instead of placing the flight helmet on the head over respirator assembly's hood, place the CB Head Harness on back of head with the hook and pile fastener on top and webbing on the back of the neck.
2. An assistant will ensure rolled webbing of the head harness is between the respirator hood and the metal toggles when attaching the snaps.
3. For proper retention of the head harness, ensure the adjustment sleeves are in the shortest positions.

Section 8-4. Maintenance

8-13. GENERAL.

8-14. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be recorded on the appropriate form in accordance with OPNAVINST 4790.2 Series.

8-15. FABRICATION OF THE CB HEAD HARNESS.

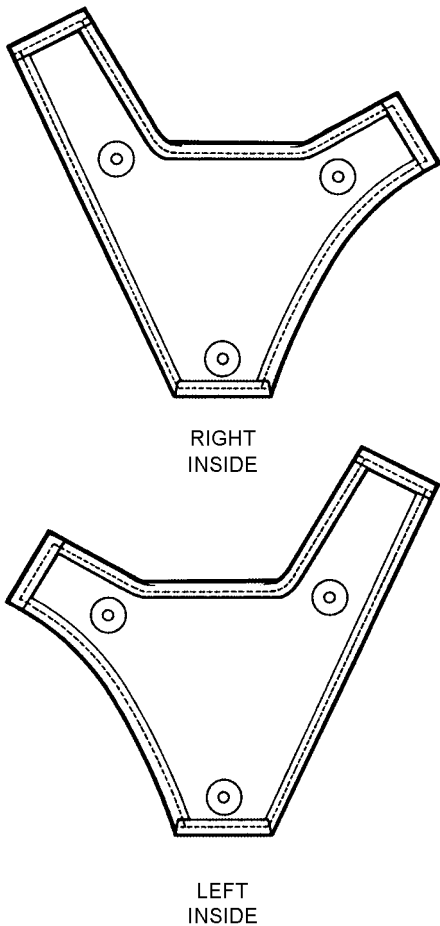
8-16. To fabricate the CB Head Harness, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
1	Head Harness Pattern, Left/Right	Figure 8-2
As Required	Cloth, Nylon Duck	NIIN 00-765-2863
As Required	Webbing, Nylon, Type XII	NIIN 00-281-3012
As Required	Webbing, Nylon, Type VIII	NIIN 00-261-8585
As Required	Webbing, Nylon, Type IV	NIIN 00-655-5123
As Required	Thread, Nylon, Size E	NIIN 00-204-3884
As Required	Fastener Tape, Hook, 2 Inch	NIIN 00-450-9837
As Required	Fastener Tape, Hook, 1 Inch	NIIN 00-106-5973
As Required	Fastener Tape, Pile, 1 Inch	NIIN 00-106-5974
6	Fastener, Snap Stud	NIIN 00-276-4908
6	Fastener, Snap Eyelet	NIIN 00-276-4978
4	Fastener, Snap Cap	NIIN 00-891-9073
4	Fastener, Snap Socket	NIIN 00-945-2577
4	Buckle	MS51940-95, NIIN 00-664-6395

NOTE

All stitching shall be with size E nylon thread, 8 to 10 stitches per inch, conforming to ASTM-D-6193 stitch Type 301. Backstitching or overstitching will be a minimum 3/4 inch. All nylon fabric and webbing shall be heat sear cut. The restraint system pattern is a left side and right side pattern marked accordingly.

1. Prepare head harness pattern #1 in accordance with Figure 8-2.
2. Position head harness pattern #1 onto the nylon duck cloth. Trace pattern and mark snap locations for each side and cut out each piece. Cut inside corners 1/8 inch inboard if needed to create flat folds.
3. Fold all edges 3/8 inch, sew in place using one row of stitches 1/4 inch from folded edge. At locations marked, set snap studs and eyelets.



Step 3 - Para 8-16

8p16s03

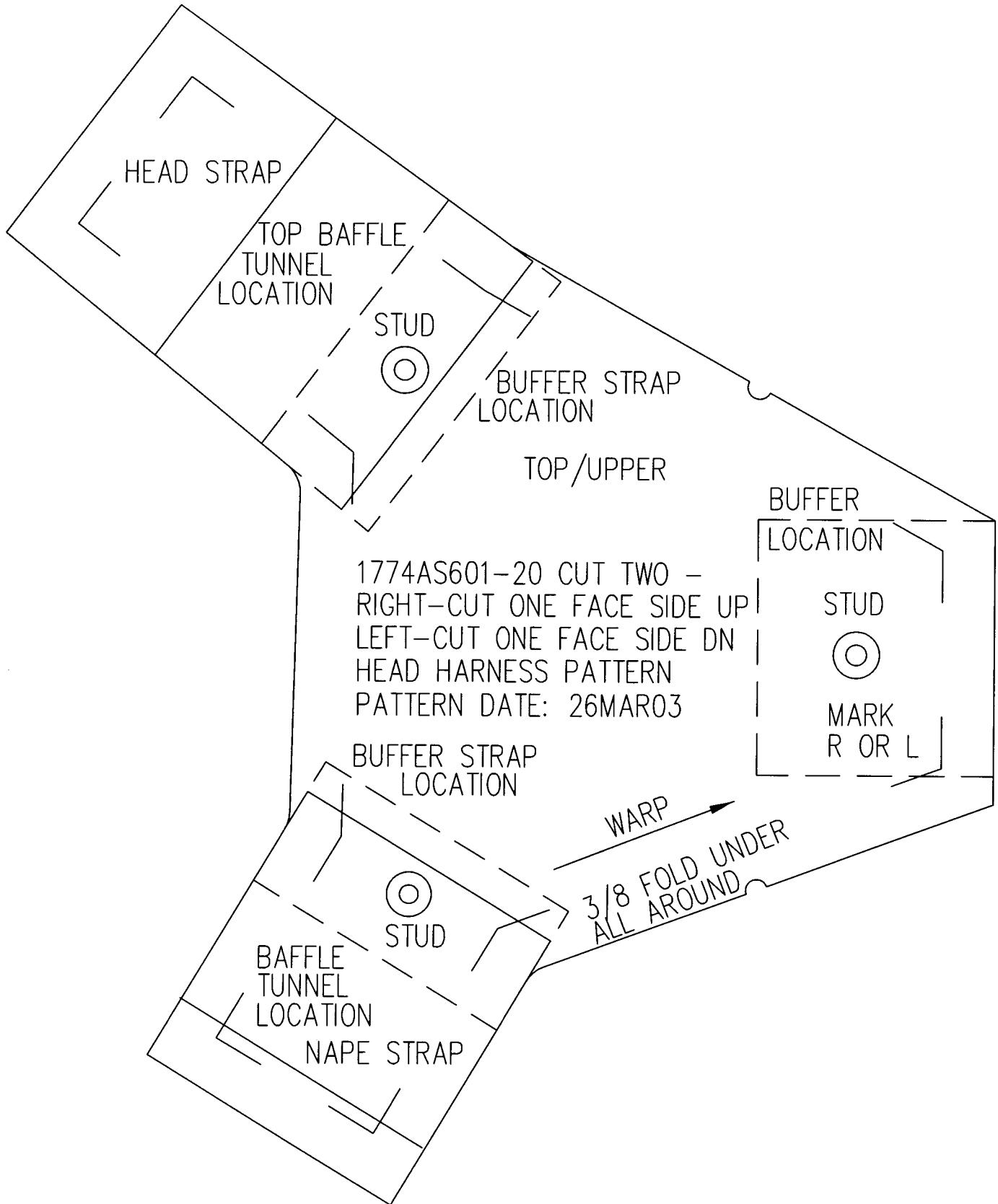
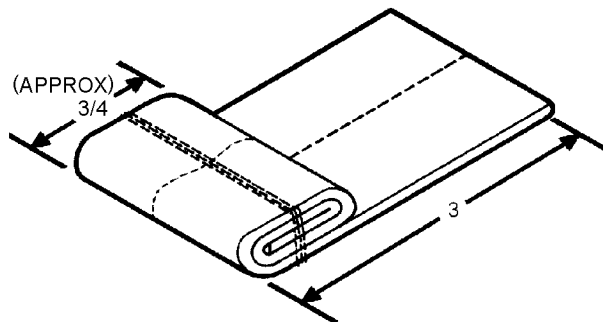


Figure 8-2. Head Harness Pattern

008002

4. Measure and cut two pieces of Type VIII webbing 7 1/4 inches, four pieces of Type XII webbing 2 3/4 inches, and four pieces of Type IV webbing 1 3/4 inches long.

5. To create the swivel link buffer strip, fold one end of Type VIII webbing 3/4 inch four times. Adjust folds so that overall finished length measurement of webbing is 3 inches. Sew folds in place using 3 rows of stitches side by side centered.



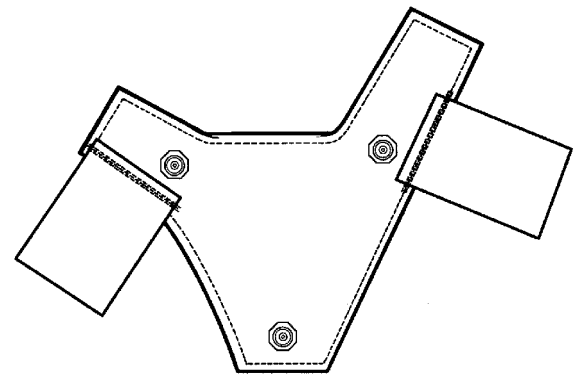
Step 5 - Para 8-16

8p16s05

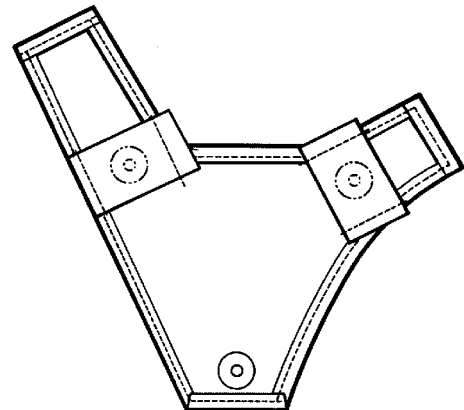
NOTE

Protect the Bromo-Butyl rubber hood material from chafing with restraint metal parts. If needed adjust or position the buffer webbings and baffle tunnels when sewing in place.

6. Position Type IV snap eyelet buffer webbing pieces in place onto the head and neck strap wings. Sew webbing in place using one row of stitches 3/8 inch from edge.



OUTSIDE
RIGHT



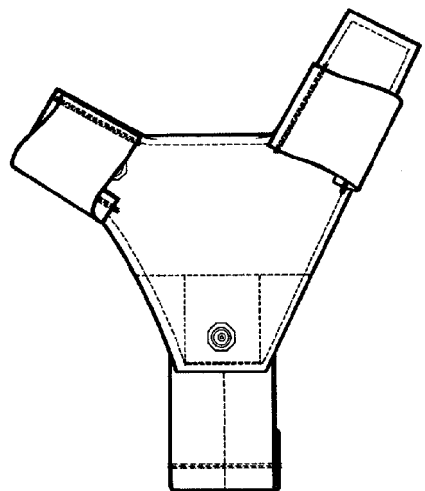
INSIDE
RIGHT

Step 6 - Para 8-16

8p16s06

7. To create the baffle tunnels, fold then sew the Type XII webbing in place onto the head and neck strap wings.

8. Sew link buffer strips in place.



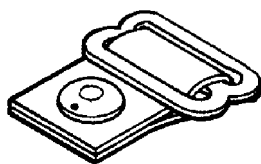
OUTSIDE
RIGHT

INSIDE
RIGHT

Steps 7 and 8 - Para 8-16

8p16s07

9. Cut four pieces of Type IV webbing 2 3/4 inches long. Reeve webbing around center bar of buckle and fold in half. With cut ends even, measure inboard from cut end 1/2 inch, center and cut hole. Set snap socket with lock lug towards center bar and dot on cap towards the cut edges. Repeat procedure for each buckle.

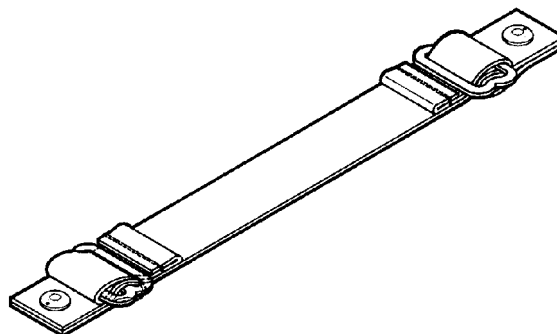


Step 9 - Para 8-16

8p16s09

10. Cut one piece of Type IV webbing 11 1/2 inches long to create nape strap webbing. Fold ends over 1/2 inch and sew in place using 3 rows of stitches side by side.

11. Reeve webbing through outside bars of buckle; fold end back and reeve through the outside bar of buckle. Repeat for other end of webbing.



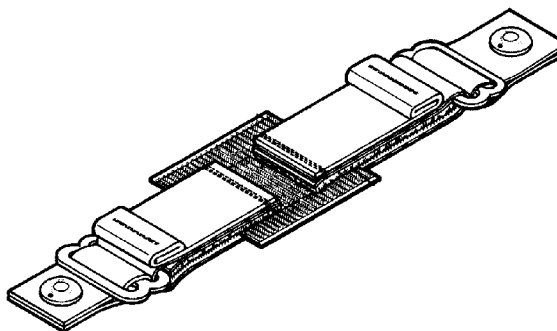
8p16s11

Step 11 - Para 8-16

12. Cut one piece of 1-inch wide hook fastener tape 12 inches long, one piece of 2-inch wide hook tape 2 inches long, two pieces of 1-inch wide pile tape 2 inches long, and two pieces of Type IV webbing 2 3/4 inches long.

13. Position 2-inch x 2-inch hook tape centered on the 12-inch piece of hook tape. With hooks facing up on both tapes. Sew together using a box stitch 1/8 inch inboard on all edges. With hooks up, place one 2-inch piece of pile tape with loops up on each end of the 12-inch hook tape and sew in place using a box stitch 1/8 inch inboard on all edges.

14. Fold one end of Type IV webbing 3/8 inch 2 times. Sew fold in place using 3 rows of stitches side by side centered. Position snap strap buckles with snap caps up and outside bar of buckle towards cap. With hooks facing up, reeve the ends through and around inside bar of buckle. Re-position head strap assembly with hooks facing down and buckles against 2-inch x 2-inch hook tape. At each end, place prepared Type IV webbing on to hook tape with cut ends even and folds up. Sew ends together with 3 rows of stitches side-by-side 1/4 inch from edge.



8p16s13

Steps 13 and 14 - Para 8-16

15. Snap the head strap and nape strap onto head harness side pieces. Adjust straps to aircrewmember when donning system. Mark and tack neck straps if needed using E thread double two turns tied off with surgeon's knot followed by a square knot.



8p16s15

Step 15 - Para 8-16

8-17. INSPECTION.

8-18. Inspection is limited to visual inspection. No functional checks for the CB Head Harness are required. The CB Head Harness shall be inspected at intervals coinciding with the A/P22P-14(V) respirator assembly inspections stated in Chapter 4. Verify condition of head harness vest by performing the following tasks:

1. Inspect webbing for cuts, tears, fraying, and contamination.

- 2. Inspect stitching for security.
- 3. Inspect hook and pile tape for damage and security.
- 4. Inspect hardware for security, corrosion, dents, burrs, distortion, sharp edges, and, if applicable, ease of operation.
- 5. Inspect buckles and straps of headstrap assembly for security of attachment, deterioration, cuts, and proper operation and adjustment.

8-19. CLEANING.

8-20. To clean a CB Head Harness, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Detergent, Laundry	Commercial
1. Mix a proper strength solution of detergent using detergent manufacturer's recommendation.		
2. Immerse head harness in solution and allow to soak for five minutes. Agitate gently for two minutes. Drain, do not wring.		
3. Rinse harness in cool, fresh water until all traces of detergent are gone.		
4. Hang harness in a dry, well-ventilated area until dry.		

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CHAPTER 9

CMU-23A/P SURVIVAL VEST,
P/N 1774AS300-1

Section 9-1. Description

9-1. GENERAL.

9-2. The CMU-23A/P Survival Vest is an SV-2B Survival Vest or CMU-23/P Survival Vest which has been modified in accordance with ACC 616 (as amended) for compatibility with the man-mounted pusher fan of the A/P23P-14A(V) CBR Protective Assembly (Upgrade) and the A/P22P-14(V)1 Respirator Assembly. Survival vests modified by ACC 616, and redesignated CMU-23A/P are dual purpose vests. For routine missions where there is no potential for CBR exposure, the vest can be configured like a non-CBR configuration in SV-2B Survival Vest (figure 9-1). With its interchangeable pocket configuration, however, the CMU-23A/P vest can be quickly reconfigured for missions requiring CBR protection.

9-3. CONFIGURATION.

9-4. When the CMU-23A/P vest is in the CBR configuration (figure 9-2), the SRU-36/P Helicopter Emergency Egress Device (HEED), Survival Knife, and MK-79 Illumination Signal Kit are stowed in individual pockets which are then attached to the

front of the vest by means of directional snap fasteners, and hook and pile tape. The pusher fan and battery pack, enclosed in their pocket assembly, are secured to the vest by a receiving bracket which provides easy donning and doffing of the respirator assembly.

9-5. The CMU-23A/P Survival Vest, P/N 1774AS201-1, used by aircrews of USN/USMC helicopter, E-2C, and C-2A aircraft shall be modified by ACC 639 to accommodate the SRU-40/P Helicopter Aircrew Breathing Device (HABD). After modification the modified CMU-23A/P Survival Vest shall be reidentified as CMU-23A/P, P/N 1774AS300-101.

9-6. APPLICATION.

9-7. The CMU-23A/P Survival Vest is intended for use by USMC helicopter aircrews operating CH-46D/E, CH-53D/E, MH-53E, and UH-1N helicopters who are equipped with the A/P23P-14A(V) Respirator Assembly and all other USN/USMC rotary wing aircrews who are equipped with the A/P22P-14(V)1 Respirator Assembly.

Section 9-2. Modifications

9-8. GENERAL.

9-9. The CMU-23A/P Survival Vest shall be updated by comparing the configuration of the assembly with the directives listed in table 9-1.

Table 9-1. CMU-23A/P Directives

Description of Modification	Application	Modification Code
Modification of CMU-23A/P, P/N 1774AS201-1, to accommodate the SRU-40/P Helicopter Aircrew Breathing Device (HABD). After modification reidentify as CMU-23A/P, P/N 1774AS300-101	All CMU-23A/P Survival Vests used in USN/USMC helicopter, E-2C, and C-2A aircraft.	66-639

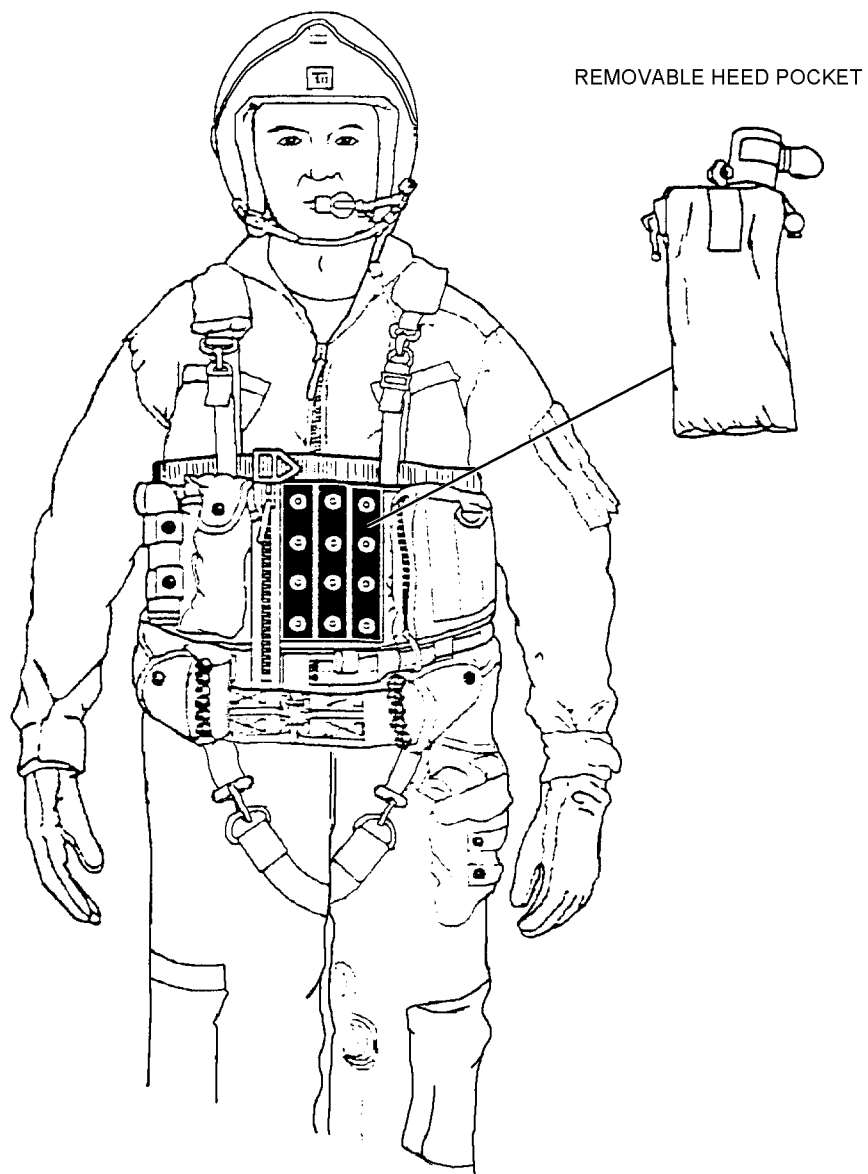


Figure 9-1. CMU-23A/P Survival Vest (Normal Configuration)

009001

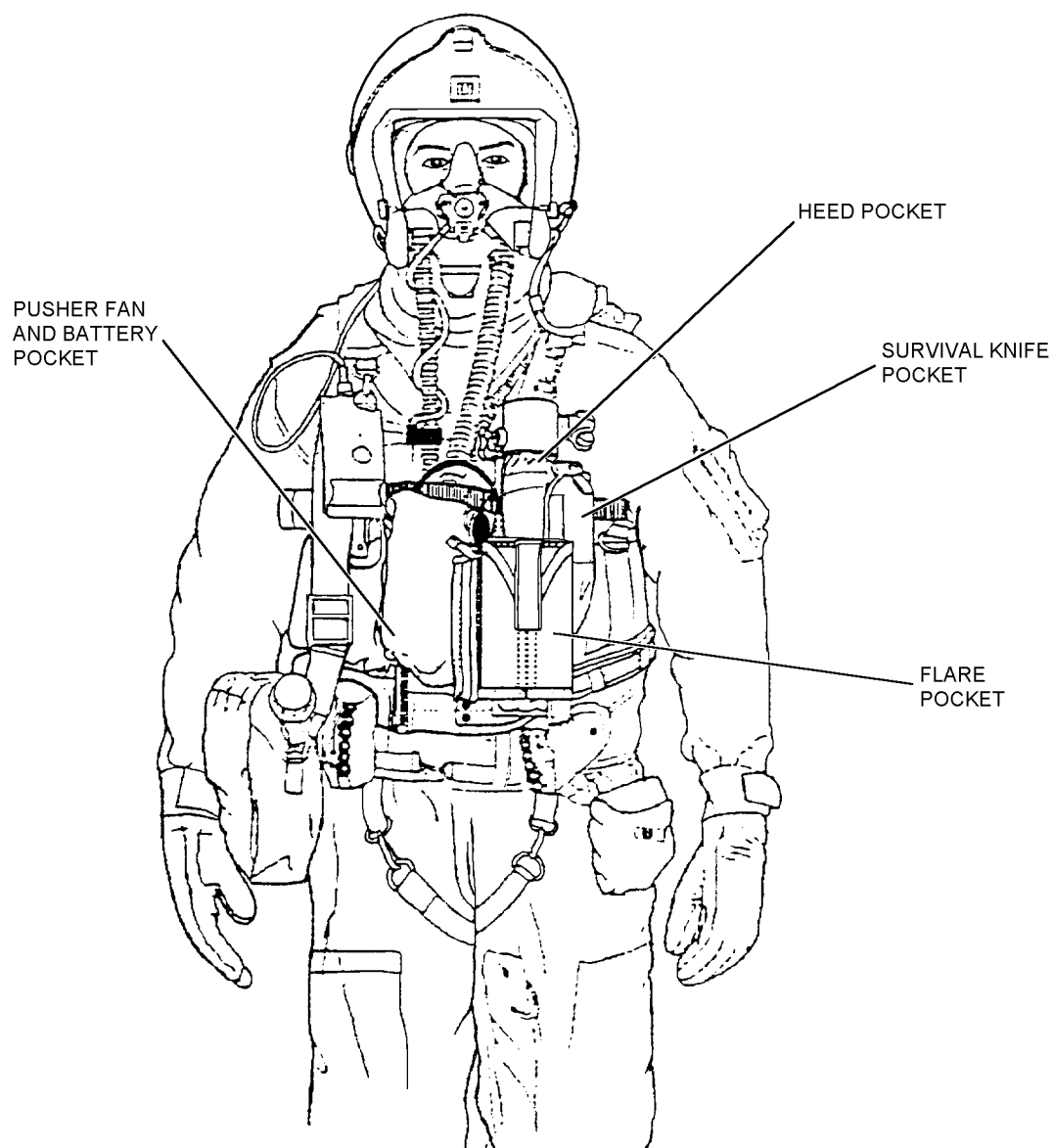


Figure 9-2. CMU-23A/P Survival Vest (CBR Configuration)

009002

Section 9-3. Maintenance

9-10. GENERAL.

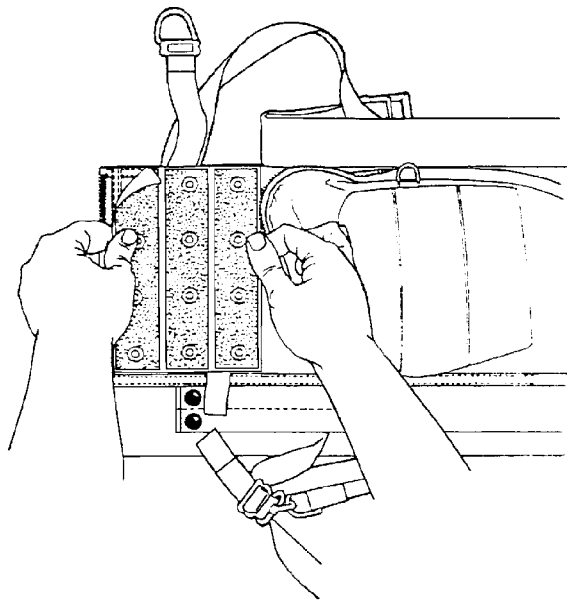
9-11. Refer to the SV-2B Survival Vest section in Chapter 6 of NAVAIR 13-1-6.7-2 for inspection, cleaning, repair and, maintenance requirements applicable to the CMU-23A/P Survival Vest.

9-12. INSTALLATION OF CMU-23A/P CONFIGURATION. To modify SV-2B and CMU-23/P Survival Vests to CMU-23A/P configuration, proceed as follows:

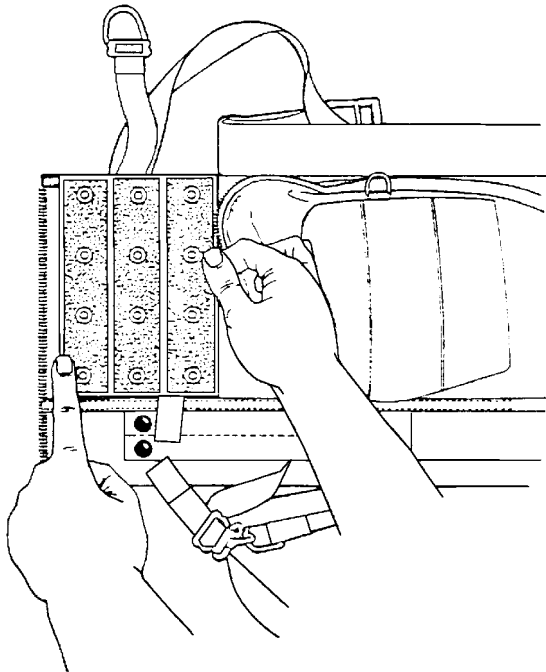
Materials Required		
Quantity	Description	Reference Number
As Required	Thread, Nylon, Sage Green, Size FF	V-T-295 NIIN 00-204-3787 (CAGE 81349)
1	Vest Snap Fastener Panel	1774AS407-1 (CAGE 30003)
1	Pistol Snap Fastener Panel	1774AS406-1 (CAGE 30003)
1	Pusher Fan and Battery Pocket Assembly	1774AS401-1 (CAGE 30003)
1	Flare Pocket Assembly	1774AS403-1 (CAGE 30003)
1	HEED Pocket Assembly	1774AS404-1 (CAGE 30003)
1	Survival Knife Pocket Assembly	1774AS405-1 (CAGE 30003)
1	Receiving Bracket Assembly	1774AS408-1 (CAGE 30003)
1	HABD Hose Pocket Assembly	1774AS412-1 (CAGE 30003)
1	HABD Bottle Pocket Assembly	1774AS413-1 (CAGE 30003)
1	HABD Hose Pistol Pocket (Non-CBR Mode) Assembly	1774AS414-1 (CAGE 30003)

Note: Components for initial modification will be included with upgraded respirators as they are returned to fleet activities and are not available through normal supply channels. Components required for compliance with ACC 616 following initial modifications shall be requisitioned through normal supply channels using stock numbers that will be assigned at a future date and announced via separate correspondence.

1. Prepare vest for modification.
 - a. Remove equipment from pistol/HEED pocket.
 - b. (CMU-23/P only) Remove and discard velcro and snap fasteners used to secure tactical ventilator hose.
 - c. (CMU-23/P only) Remove four snap fasteners and webbing adjacent to slide fastener.
 - d. Remove approximately six inches of stitching securing V-ring end of hoisting strap to vest.
2. Remove pistol/HEED pocket from vest by carefully cutting stitching attaching it to vest and retain pocket for further modification.
3. Position Vest Snap Fastener Panel (with studs and pile tape) so 5 1/2-inch side is directly atop and even with the bound top edge of vest.



a. Position 7 1/2-inch side so it is atop and even with edge of vest fabric in which slide fastener is installed.

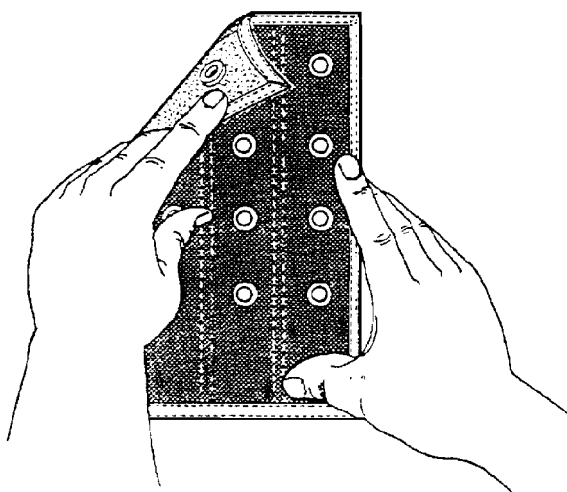


Step 3a - Para 9-12

9p12s3a

b. Sew in place with one row of stitching 1/8 inch from bound edge of panel, around perimeter of panel using 8 to 10 stitches per inch.

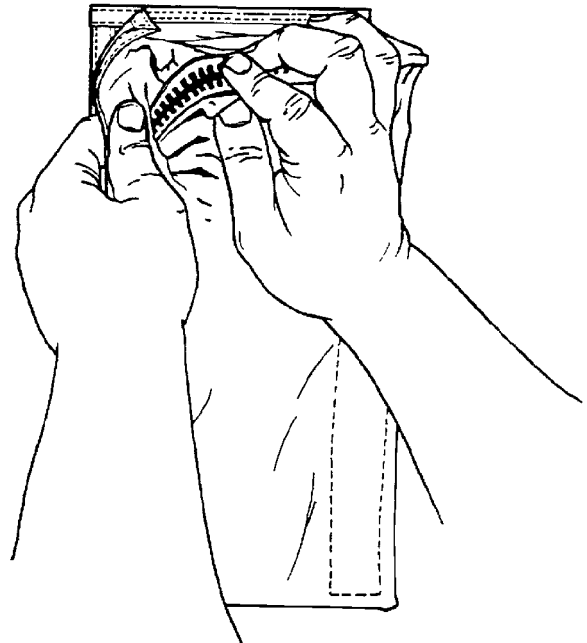
4. Lay Pistol Snap Fastener Panel, hook tape/sock-et side down.



Step 4 - Para 9-12

9p12s4

a. Position rear face of pistol/HEED pocket over snap panel so edges align.



Step 4a - Para 9-12

9p12s4a

b. Sew pocket to panel around perimeters using one row of stitching 1/8 inch from edge at 8 to 10 stitches per inch.

5. Reinstall V-ring end of hoisting strap to vest in accordance with the SV-2B Survival Vest section in Chapter 6 of NAVAIR 13-1-6.7-2.

6. Reattach pistol/HEED pocket to vest using velcro and snap fasteners.

9-13. INSTALLATION OF CMU-23A/P SURVIVAL VEST CBR CONFIGURATION. To configure the CMU-23A/P vest for use on missions into CBR threat environments, proceed as follows:

CAUTION

Snap fasteners used to attach pockets to the vest are unidirectional Pull-the-Dot type which are used to prevent inadvertent separation. Resetting the snap fasteners may be difficult, use care to avoid damaging the snaps during attachment and removal.

1. Unsnap and remove pistol/HEED pocket.

2. Remove HEED from pistol/HEED pocket and reinstall it in HEED Pocket Assembly securing it to D-ring inside the pocket.

3. Remove MK-79 Illumination Signal Kit from pistol/HEED pocket and reinstall it in Flare Pocket Assembly securing the retaining lanyards to grommet install in top flap of pocket using bowline knots.

4. Remove survival knife from pistol/HEED pocket and reinstall it in Survival Knife Pocket Assembly securing retaining lanyard to grommet near top of pocket using bowline knot.

5. Attach Survival Knife Pocket to side of HEED Pocket and the Flare Pocket to the front of HEED Pocket using snap fasteners and hook and pile tape.

6. Lay CMU-23A/P Survival Vest on flat surface with snap fastener panel facing up and on left. See [figure 9-3](#).

a. Attach Receiving Bracket Assembly to six snap fasteners in upper left quadrant of panel.

b. Attach HEED Pocket Assembly (with attached knife and flare pockets) to four vertically aligned snaps on right side of panel.

7. Enclose pusher fan and manifold of the respirator assembly in the Pusher Fan/Battery Pocket Assembly.

a. Ensure pusher fan inlet is not obstructed.

b. Route power cord so it exits pocket near pusher fan inlet.

c. Ensure slide fastener is fully closed.

8. Insert power cord in battery pack 3-pin receptacle and stow battery pack in pocket so power cord exits through battery pocket opening.

9-14. FABRICATION OF HELICOPTER AIRCREW BREATHING DEVICE, SRU-40/P (HABD) POCKET ASSEMBLY. The HABD pocket assembly consists of a Bottle Pocket and a CBR Hose Pocket or Non-CBR Hose Pocket to be fabricated as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Cloth, Nylon Duck	MIL-C-7219, NIIN 01-173-4436
As Required	Fastener Tape, Hook, 1-Inch	MIL-F-21840, NIIN 00-106-5973
As Required	Fastener Tape, Pile, 1-Inch	MIL-F-21840, NIIN 00-405-2263
As Required	Fastener Tape, Hook, 2-Inch	MIL-F-21840, NIIN 00-450-9837
As Required	Fastener Tape, Pile, 2-Inch	MIL-F-21840, NIIN 00-405-2265
As Required	Webbing, Textile, 1-Inch	MIL-W-5664D, NIIN 00-263-3600
As Required	Webbing, Textile, 1-Inch	MIL-T-5038G, NIIN 00-261-8579
As Required	Tape, Textile, 1-Inch	MIL-T-5038G, NIIN 00-753-6144
As Required	Thread, Nylon, Size E, Sage Green	V-T-295, NIIN 00-204-3884
3	Cap, Snap Fastener	MS27983-1, NIIN 00-891-9073
3	Socket, Snap Fastener	MS27983-2, NIIN 00-945-2577
6	Stud, Snap Fastener	MS27983-3, NIIN 00-276-4908
6	Post, Snap Fastener	MS27983-4, NIIN 00-276-4978
3	Grommet, Size 00	MS20230B20, NIIN 00-291-0302
1	Strap, Tie Down	MIL-S-23190, NIIN 00-111-3208
1	Bead, Inflation Handle (Note)	975AS122-1
1	Breathing Device, Helicopter Aircrew, SRU-40/P	1586AS301-1

Note: Obtain bead for inflation handle from Beaded Handle Assy (P/N 975AS121-11, NIIN 01-120-4752) or salvage from LPU-21 or LPU-23 beaded handles.

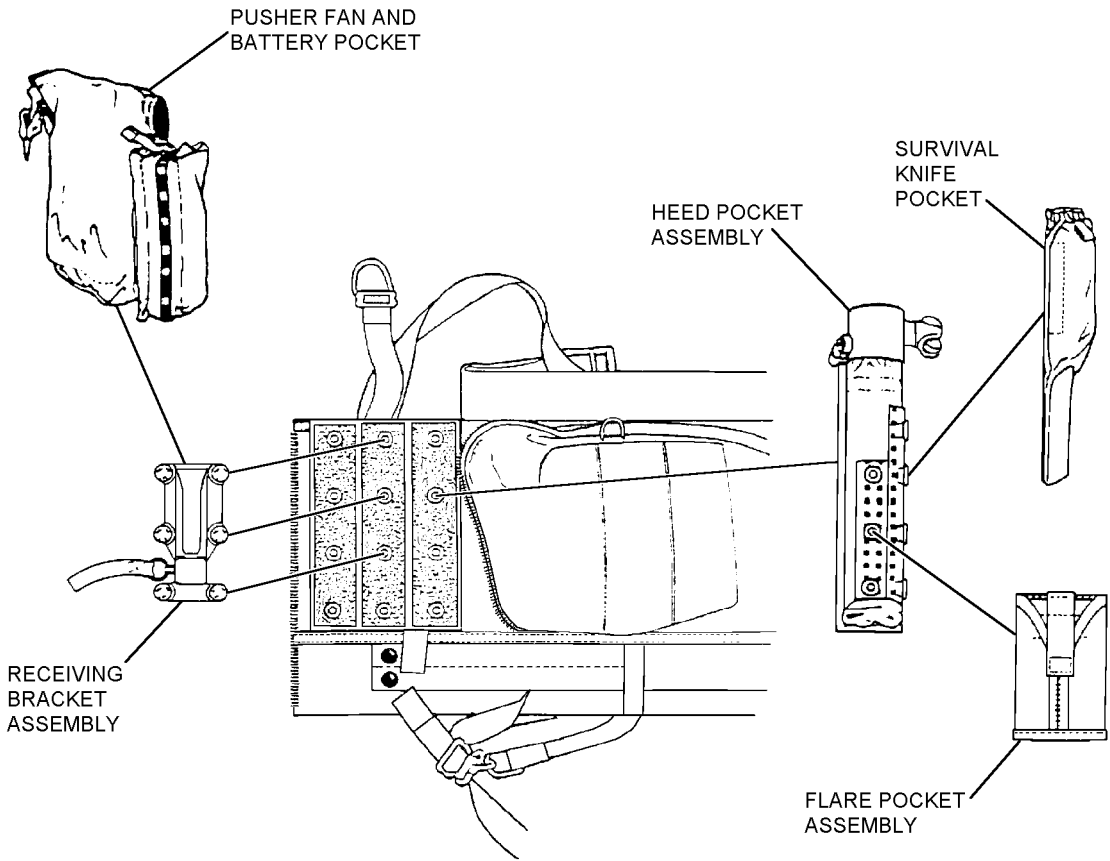


Figure 9-3. Attachment of CMU-23A/P Survival Vest CBR Components

009003

NOTE

Sear all cut edges of nylon webbing and tape to prevent fraying (recommend use of Cutter, Nylon Webbing, NIIN 00-956-008). Do not form sharp edges. Unless otherwise specified all stitching shall be Type 301, 8 to 10 stitches per inch, with minimum 3/4-inch back or over stitch. All stitching shall be 1/8 inch from edge unless otherwise specified. All binding tape shall be sewn using two rows of stitching 1/8 inch apart. Use china marker or equivalent for all markings.

9-15. Fabrication of Bottle Pocket Panel. Refer to figure 9-4 and proceed as follows:

1. Cut a piece of nylon duck cloth 4 3/4 x 8 inches and bind the 8-inch edges with 1-inch binding tape.

2. Cut two 4 3/4-inch lengths of 2-inch hook tape.

3. Orient duck cloth so 8-inch edges are at top and bottom.

4. Measure and mark bottom edge 1 3/4 inches from lower left-hand corner.

5. Measure and mark top edge 1 3/4 inches from top left-hand corner.

6. Draw a vertical line connecting the two 1 3/4-inch positions.

7. Place the two pieces of hook tape with 4 3/4-inch edges side by side along the right side of the vertical line.

8. Sew all edges of both pieces of hook tape in place.

9. Measuring from the top left-hand corner mark portions at 2 3/4 and 4 3/4 inches along top edge.

10. Measuring from the lower left-hand corner mark positions at 2 3/4 and 4 3/4 inches along bottom edge.

11. Draw vertical lines connecting the 2 3/4-inch portions and the 4 3/4-inch positions.

12. On the vertical line between the 2 3/4-inch positions, measuring from the top, mark portions at 1/2 inch, 2 1/2 inches, and 4 1/2 inches.

13. On the vertical line between the 4-3/4-inch positions, measuring from the top, mark positions at 1/4 inch, 2 1/4 inches, and 4 1/4 inches.

14. Punch holes at marked positions.

15. Set posts and studs in the holes with studs showing on the hook tape side.

16. From the top edge, between the two lengths of installed hook tape, measure down 3/8 inch and mark.

17. Punch a hole at the mark and set a grommet in the hole.

18. Measuring from the top left-hand corner mark a position on the top edge at 1/2 inch.

19. Measuring from the bottom left-hand corner mark a position on the bottom edge at 1/2 inch.

20. Draw a vertical line connecting the two 1/2-inch positions.

21. Fold the bottle panel in half so the 4 3/4-inch seared edges meet and the hook tape is showing.

22. Stagger the placement of the top and bottom edges to be side by side rather than stacked to reduce the number of layers.

23. Sew a row of stitches along the line connecting the 1/2-inch marks.

9-16. Fabrication of the HABD Hose Pocket Panel For Non-CBR Configuration. Refer to figure 9-5 and proceed as follows:

1. Cut a piece of nylon duck cloth measuring 10 x 6 1/2 inches.

2. Orient the cloth so the 6 1/2-inch edges are at the top and bottom.

3. Measure and mark the right-hand edge 1 1/4 inches down from the top right-hand corner.

4. Draw a cutline from the top left-hand corner to the 1 1/4-inch mark on the right-hand edge and cut the fabric along the line.

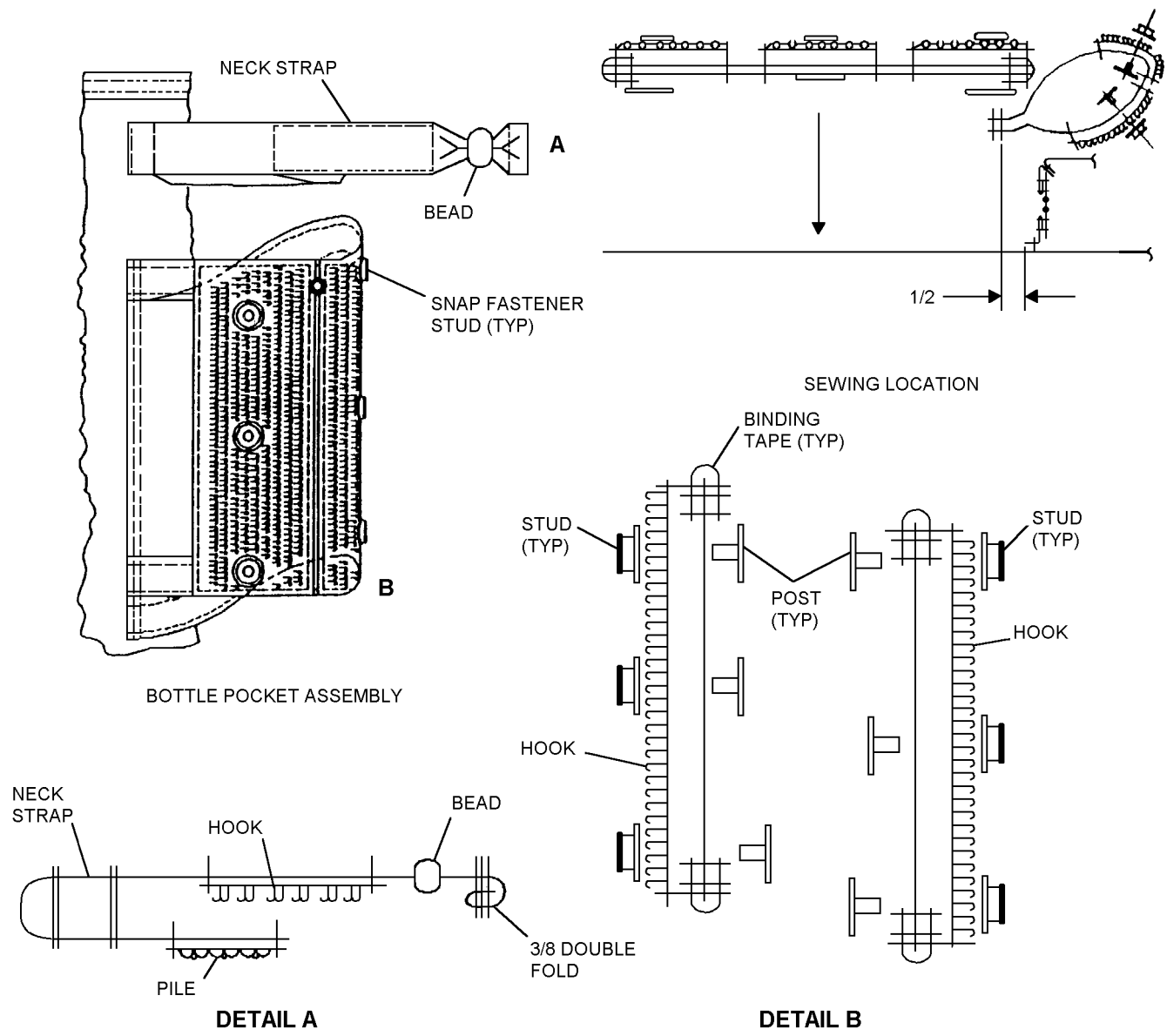


Figure 9-4. Fabrication of SRU-40/P HABD Bottle Pocket Assembly

009004

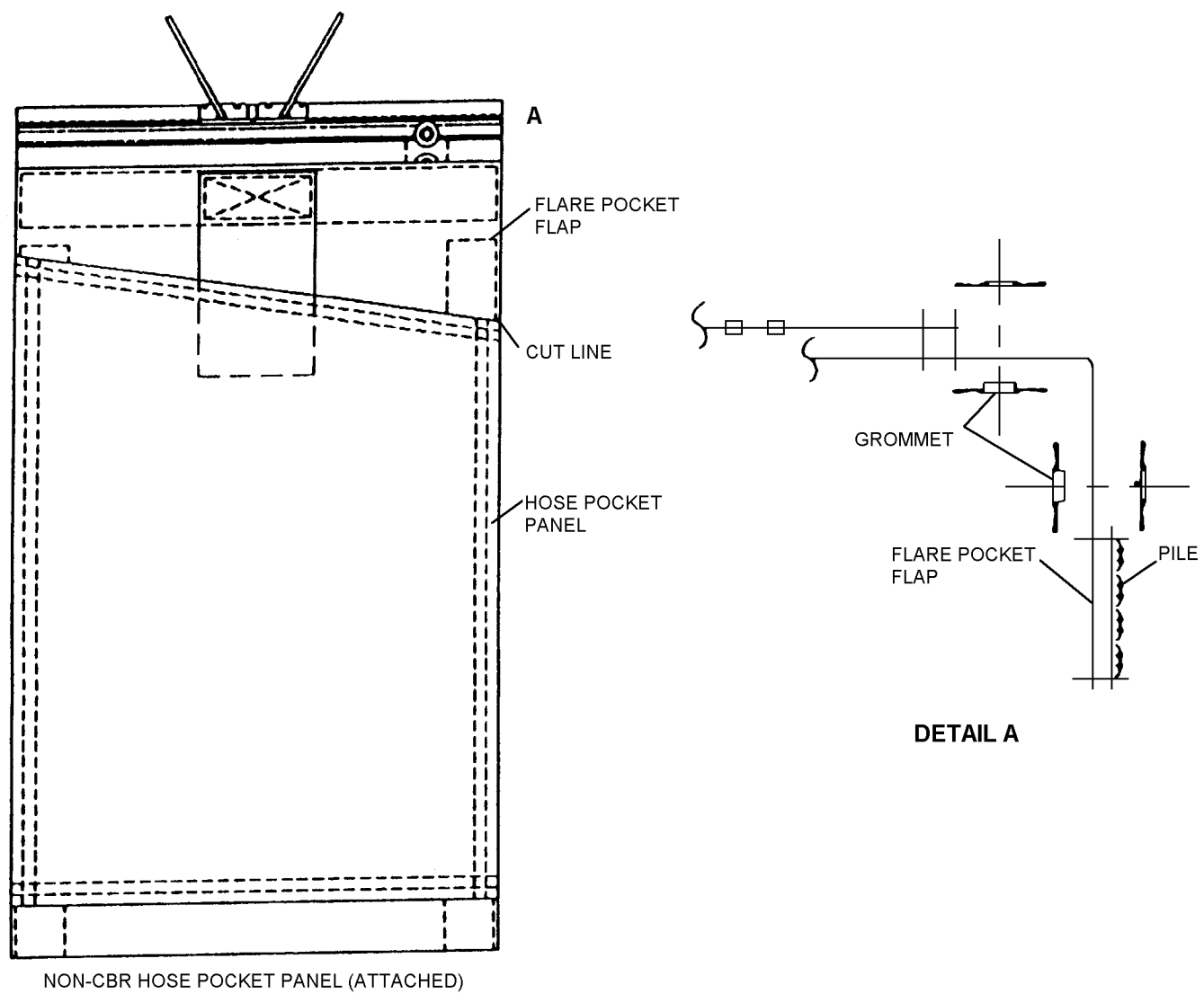


Figure 9-5. Non-CBR Hose Pocket Assembly

009005

5. Double fold the top and bottom edges 3/8 inch to the back side of the fabric.

6. Stitch a hemline 1/8 inch from the outer edge and another 1/4 inch from the edge.

7. Single fold the side edges 3/8 inch to the back side of the fabric and sew edges in place 1/8 inch from folded edge.

9-17. Attaching HABD Hose Pocket Panel to Pistol Pocket. Refer to [figure 9-5](#) and proceed as follows:

1. Unfasten the flare pocket on the pistol pocket.
2. On the face of the flare pocket flap, measure and mark the left edge 1 inch down from the top left-hand corner.
3. On the face of the flare pocket flap, measure and mark the right edge 2 1/4 inches down from the top right-hand corner.
4. Position the hose pocket panel on the outside face of the flare pocket flap so the top left-hand corner of the panel is aligned at the 1-inch mark and the top right-hand corner is aligned with the 2 1/4-inch mark.
5. Sew the left and right sides of the panel in place on the flare pocket flap using one row of stitches 1/8 inch from the outer edge and another at 1/4 inch from the outer edge. Reinforce with a minimum backstitch of 1 inch.

9-18. Fabrication of HABD Bottle Neck Strap. Refer to [figure 9-4](#) and proceed as follows:

1. Cut a 12 1/2-inch length of 1-inch webbing. Measure and mark 2 inches from one end.
2. Turn webbing over and, measuring from the same end as in [step 1](#), mark webbing at 4 inches, 6 1/2 inches, and 9 1/2 inches.
3. Cut a 2-inch length of 1-inch pile tape and sew on webbing between the end and the 2-inch mark measured in [step 1](#).
4. Cut a 3-inch length of 1-inch hook tape and sew in place on webbing between 6 1/2-inch and 9 1/2-inch marks measured in [step 2](#).

5. On hook tape end of webbing, slide a bead onto the webbing until it touches the hook tape.

6. Make 3/8-inch double fold, end over end, on end of webbing and sew the fold together using three rows of stitches placed side by side.

7. Fold webbing at the 4-inch mark so hook tape is on the inside and pile tape is outside.

9-19. Setting Grommet on Pistol Pocket. Refer to [figure 9-5](#) and proceed as follows:

1. Unfasten the upper flap of the flare pocket.
2. Turn pocket over and lay it flat so the pile tape is facing up and is at bottom.
3. Measure and mark the right-hand edge in two places; 1 1/4 inches and 1 3/4 inches up from the bottom right-hand corner.
4. Measure and mark grommet locations 1 1/2 inches to the left of the 1 1/4 and 1 3/4-inch marks made in [step 3](#).
5. Punch holes at marked locations and set grommets.

9-20. FABRICATION OF HABD HOSE POCKET FOR CBR CONFIGURATION. The HABD hose pocket consists of two major parts, the back panel and the front panel.

9-21. Fabrication of Back Panel of HABD Hose Pocket. Refer to [figure 9-6](#) and proceed as follows:

1. Measure and cut a piece of nylon duck cloth 16 inches x 4 1/2 inches.
2. Orient the cloth so the 4 1/2-inch edges are at the top and bottom.
3. Measure and mark the right-hand edge of the cloth 1 1/4 inches up from the lower right-hand corner.
4. Measure and cut 6 1/2-inch length of 2-inch pile tape.
 - a. With pile facing up and the length of the pile tape positioned with its right edge aligned with the right edge of the cloth, place lower right-hand corner of pile tape at the 1 1/4-inch mark made in [step 3](#).
 - b. Sew the left edge of the pile tape in place.

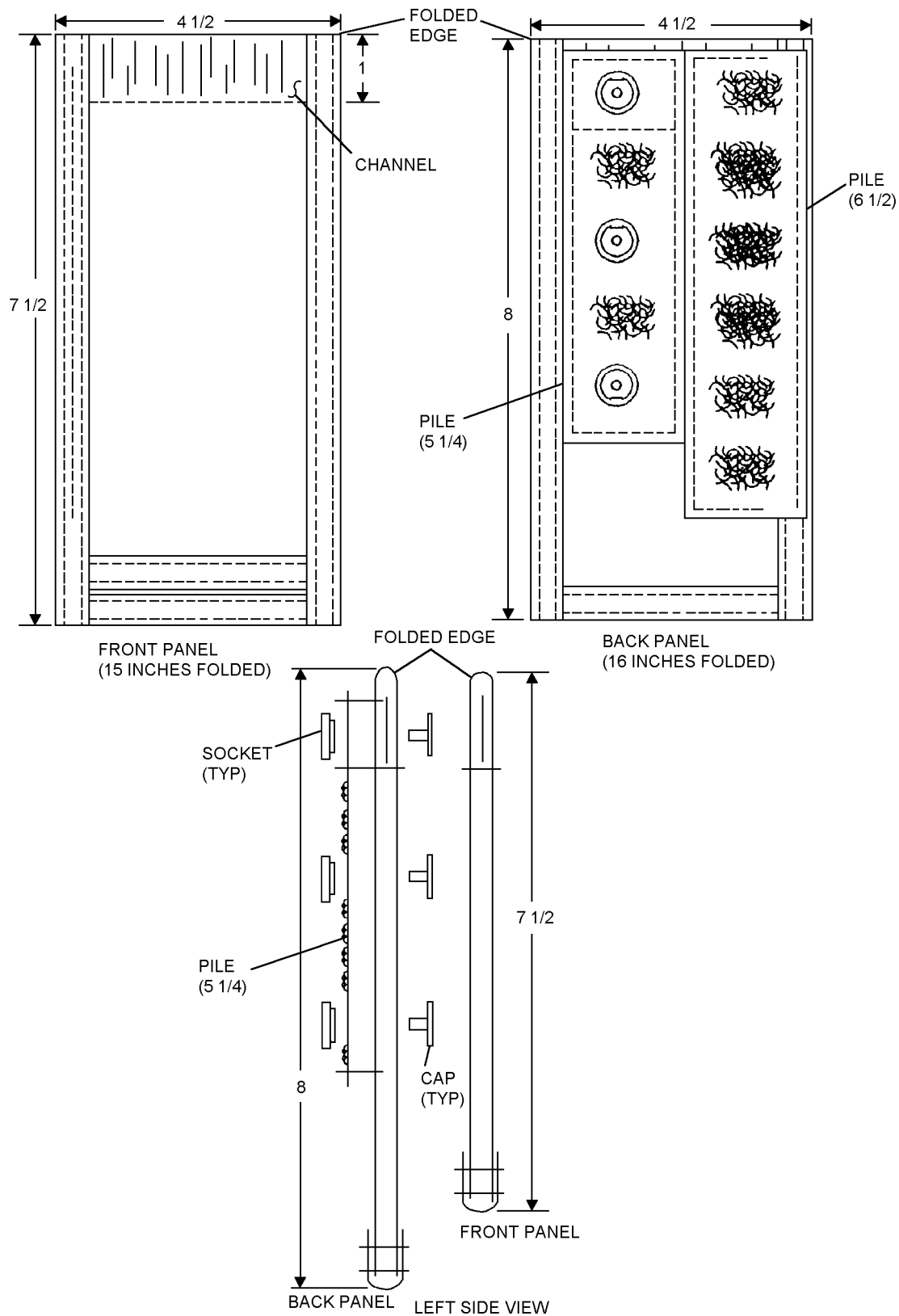


Figure 9-6. Fabrication of CBR Hose Pocket Assembly

009006

c. Sew the top and bottom of the pile tape in place to within 3/4 inch of the right edge of the cloth.

5. From the lower left-hand corner of the sewn pile tape, measure up 2 1/2 inches and mark the position on the left edge of the tape.

6. Measure and cut a 5 1/4-inch length of 2-inch pile tape.

a. Place pile tape next to the sewn edge of the pile tape attached in step 4b aligning the top edges and ensuring the lower right-hand corner of the tape is positioned at the 2 1/2-inch mark made in step 5.

b. Sew all edges of the 5 1/4-inch pile tape in place.

c. Measure and mark a line down the center of the 5 1/4-inch length of pile tape.

d. Measuring up the center line from the bottom edge of the 5 1/4-inch tape, mark positions at 3/4 inch, 2 3/4 inches, and 4 3/4 inches.

7. Fold the panel in half leaving the 4 1/2-inch folded edge as the top.

a. Bind the bottom edge of the panel with 1-inch textile tape.

b. Measure and mark the right and left edges 1 inch down from the folded edge of the top.

c. Draw a sew line connecting the 1-inch marks.

d. Sew along the sew line to 3/4 inch from the right edge creating a 1-inch wide channel.

8. Measure and cut a 3-inch length of 1-inch elastic and slide the elastic through the channel created in [step 7d](#).

9. Align the right end of the elastic with the right edge of the channel.

10. Fold back the 6 1/2-inch pile tape installed in [steps 4a through 4c](#) and sew the right end of the elastic to the pile tape (through the elastic and the nylon fabric, not through the pile tape).

9-22. Fabrication of Front Panel of HABD Hose Pocket. Refer to [figure 9-6](#) and proceed as follows:

1. Measure and cut a piece of nylon duck cloth 15 inches X 4 1/2 inches.

2. Orient the cloth so the 4 1/2-inch edges are at the top and bottom.

3. Fold the cloth in half so the 4 1/2-inch folded edge is now at the top.

4. Bind the two bottom edges with 1-inch textile tape.

5. Measure and mark right and left edges 1 inch down from the top folded edge.

a. Draw a sew line connecting the 1-inch marks.

b. Sew along the sew line creating a 1-inch channel.

6. Measure and cut a 3-inch length of 1-inch elastic and slide the elastic into the channel.

7. Align one end of the elastic with one of the edges of the channel and sew the edges together.

9-23. Assembly of the HABD Hose Pocket. Refer to [figure 9-6](#) and proceed as follows:

1. Place the back panel on top of the front panel with the pile tape side of the back panel facing up and the sewn elastic edges of each panel aligned, one on top of the other.

2. Align the top edges, top corners, and the left and right edges of the panels.

3. Fold back the 6 1/2-inch pile tape and bind the right edges of the panels together with 1-inch textile tape.

4. Sew right edge of 6 1/2-inch pile tape in place over binding tape.

5. Stretch remaining edge of elastic of back panel through the channel to opposite edge and sew in place.

6. Punch holes through back panel only at 3/4-inch, 2 3/4-inch, and 4 3/4-inch marks made on center line of pile tape in [step 6d](#), [paragraph 9-21](#).

a. Set caps and sockets in holes so sockets show on the pile tape side.

NAVAIR 13-1-6.10

b. The top two sockets shall have their flat locking edge on top and the lowest socket shall have the flat locking edge toward the bottom (figure 9-6).

7. Stretch elastic of the front panel through channel to opposite edge and sew remaining edge in place.

8. Bind left edges of panels together using 1-inch textile tape.

9-24. Attachment of HABD Bottle Pocket. Refer to figure 9-4 and proceed as follows:

1. Locate the point between the attachment point of the snap panel to the vest and the bottom edge of the side fastener tape of the general pocket.

2. Draw a line outlining where the right edge of the snap panel lays on the vest.

3. Carefully remove the stitching from the right edge of the snap panel that attaches the panel to the vest.

4. Measure and mark a line 1/2 inch to the left of the snap panel edge line.

5. Place the bottle pocket on the vest with the bottom of the bottle pocket just above the edge of the lower binding on the vest.

6. Align the 4 3/4-inch seared edges with the 1/2-inch line on the vest and the 1/2-inch marks on the pocket with the line from the snap panel edge.

7. Sew the bottle pocket in place with two rows of stitches side by side beginning 1/4 inch from the seared edge of the 4 3/4-inch side. Be careful not to sew beyond the stitching of the bottle pocket.

9-25. Attachment of the HABD Bottle Neck Strap. Refer to figure 9-4 and proceed as follows:

1. Locate the binding on the top edge of the vest.

2. Measure and mark 1 inch to the left of the snap panel edge line at the bottom edge of the binding.

3. Orient the bottle neck strap so the folded edge is on the left edge and the bead is on the right.

4. Place the top corner of the fold at the 1-inch mark.

5. Sew strap in place with two rows of stitches side by side 1-inch from the folded edge.

6. Resew the snap panel onto the vest using two rows of stitches along the original stitch lines.

9-26. Attaching Hook Tape to CBR Pusher Fan Pocket When Using the HABD Bottle. Refer to figure 9-7 and proceed as follows:

1. Measure and cut a 5-inch length of 2-inch hook tape.

2. Locate top left corner of the right side panel of the CBR pusher fan battery pocket.

3. Place the hook tape on the battery pocket aligning the 2-inch edge of the hook tape with the top edge of the pocket and the left edge of the pocket.

4. Sew hook tape in place.

9-27. REMOVAL AND DISPOSITION OF THE SRU-36/P HELICOPTER EMERGENCY EGRESS DEVICE (HEED). Prior to beginning the modification in accordance with ACC 639 the SRU-36/P and its supporting modifications must be removed from the vest as follows:

1. Remove the SRU-36/P from the pistol pocket and return it to supply in F condition.

2. Remove stitching securing the SRU-36/P tether inside the pistol pocket; remove and discard the tether.

3. If vest is configured with the SRU-36/P pocket assembly, P/N 1774AS304-1, unsnap pocket assembly from vest and return it to supply in F condition.

9-28. STOWING THE SRU-40/P HELICOPTER AIRCREW BREATHING DEVICE (HABD) IN RECONFIGURED SURVIVAL VEST. Ensure the SRU-40/P HABD has been inspected in accordance with NAVAIR 13-1-6.5 and proceed as follows:

1. Check to ensure HABD is in RFI condition.

2. Place HABD in new pocket and secure bottle neck strap around bottle neck.

3. Route regulator hose down through top of hose pocket in a single U-shaped loop, leaving regulator out.

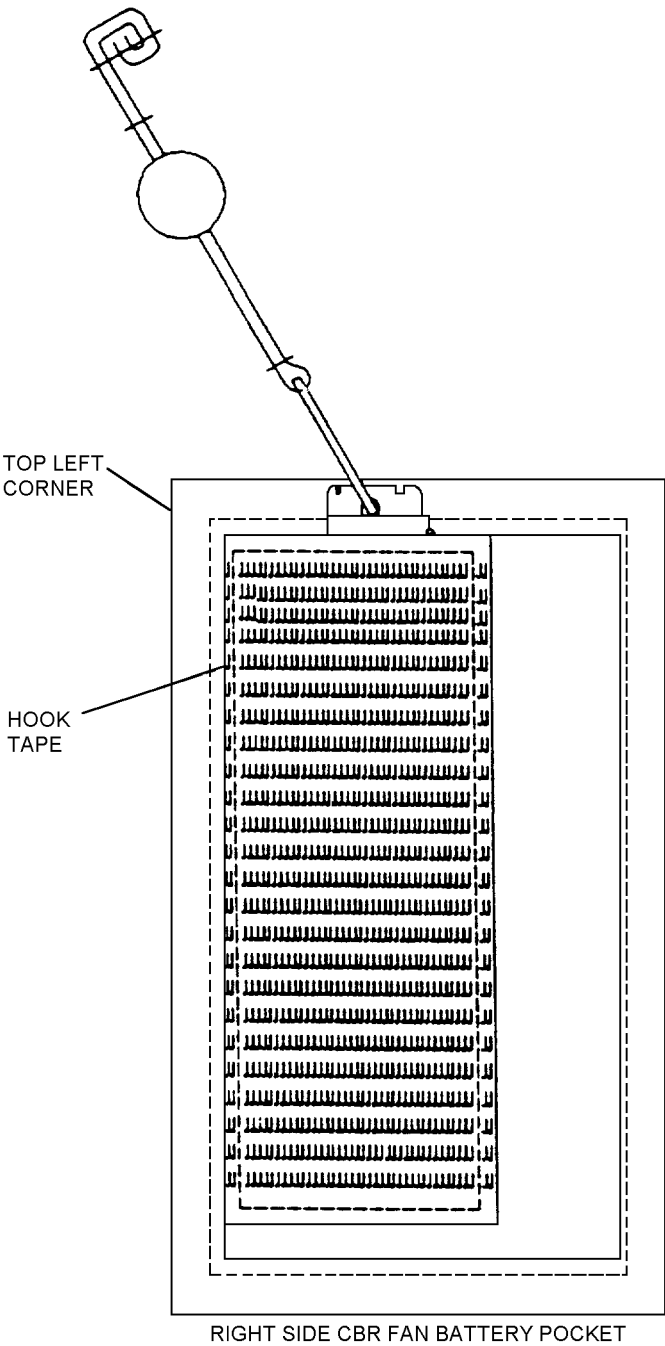


Figure 9-7. Attachment of Hook Tape to CBR Pusher Fan Battery Pocket

009007

9-29. Stowing Non-CBR Configuration.

- 1. Pass a plastic tie wrap through the center of the mouthpiece cover, around the top and through both grommets.
- 2. Secure tie wrap so it is tight around the cover, but not pinching.
- 3. Place regulator inside mouthpiece cover and position the mouthpiece so it is between the bottle and the regulator with the regulator purge cover facing toward the entrance slide fastener of the vest.

9-30. Stowing CBR Configuration.

- 1. Pass plastic tie wrap through the center of the mouthpiece cover, around the narrowest part of the cover and through both grommets.
- 2. Secure the tie wrap tightly around the cover.
- 3. Place regulator inside mouthpiece cover and position the mouthpiece so it is between the bottle and the regulator with the regulator purge cover facing toward the entrance slide fastener of the vest.

9-31. FABRICATION OF HEED TETHER. The HEED Tether is comprised of two assemblies, a snap hook assembly and a handle assembly. Each assembly is fabricated as follows:

Materials Required		
Quantity	Description	Reference Number
1	Bead, Inflation Handle	975AS122-1
As Required	Thread, Nylon, Size E, SG Type 1 or Type 2	V-T-295 NIIN 00-204-3884
As Required	Fastener Tape, Pile, 1-Inch	MIL-F-21840 NIIN 00-106-5974
As Required	Fastener Tape, Hook, 1-Inch	MIL-S-21840 NIIN 00-106-5973
1	Snap Hook, 1-Inch Base	MIL-S-43770/1 NIIN 01-187-9402
As Required	Cord, Type 1A	MIL-C-5040 NIIN 00-292-9920

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Webbing, 1-Inch, Nylon, Type II, Shade 33538	MIL-W-4088
As Required	Tape, Webbing, 1-Inch, (Alternate)	MIL-T-5038 NIIN 00-262-1643

NOTE

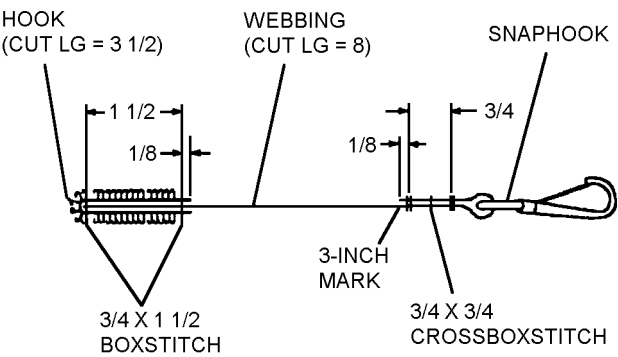
All stitching shall be 301 lock stitch, 6 to 9 stitches per inch, 1/8 inch from edge.

- 1. For snap hook assembly, measure 8-inch length of 1-inch webbing and sear cut ends.

- a. Measure and mark 3 inches from either end of webbing.

- b. Insert marked end of webbing through snap hook and fold over to 3-inch mark and sew using 3/4 x 3/4-inch crossboxstitch.

- c. Cut 3 1/2-inch of 1-inch hook tape and fold in half with hook side out. Sandwich free-end of webbing between folded hook tape and sew together using 3/4 x 1 1/2-inch boxstitch.



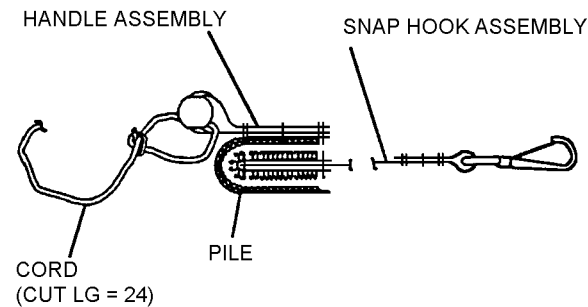
Steps 1b and 1c - Para 9-31

- 2. For handle assembly, measure 6-inch length of 1-inch webbing and sear cut ends.

- a. Thread end of webbing through inflation handle bead; center, fold in half, and align webbing ends.

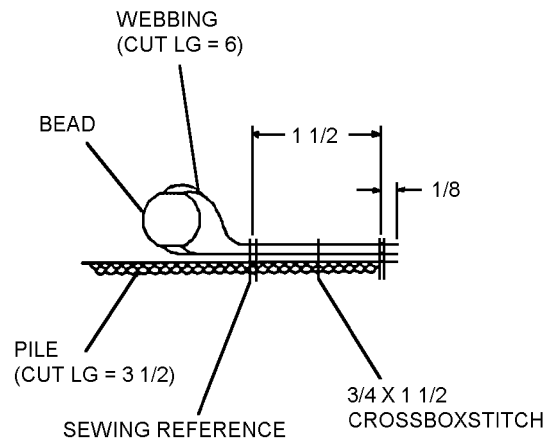
b. Cut 3 1/2-inch length of pile tape. Measure and mark sewing reference line at mid point of pile tape.

c. Place pile tape on top of folded webbing with pile facing out. Align end of pile with ends of webbing and sew together using 3/4 x 1 1/2-inch cross-boxstitch leaving opposite end of pile tape free and extending beyond handle bead.



9p31s3

Steps 3 and 4 - Para 9-31



9p31s2a

Steps 2a thru 2c - Para 9-31

3. To assemble snap hook assembly and handle assembly, align sewn end of pile tape on handle assembly with end of hook tape sewn to top of snap hook webbing. Mate pile tape with hook tape around end of snap hook assembly and along bottom of webbing.

4. Cut a 24-inch length of cord and thread end through webbing loop on which handle bead is installed and secure loose loop with bowline knot and lock with overhand knot. Total length of assembled tether from tip of snap hook to neck of HEED should be 29 inches ±1 inch.

NOTE

The opposite end of the cord is secured to neck of HEED bottle.

9-32. FABRICATION OF CMU-23A/P CONFIGURATION COMPONENTS. Figure 9-8 illustrates the locations of the components which make up the CBR mode configuration of the CMU-23A/P Survival Vest.

Materials Required		
Quantity	Description	Reference Number
1 Yd	Nylon Fabric	MIL-C-7219 NIIN 01-173-4436
20-Inches x 20-Inches	Vinyl Coated Nylon	MIL-C-20696 NIIN 00-616-0022
2	Slide Fastener, Size MED	A-A-55634 NIIN 00-252-5398
2	Bottom Stops, LG	A-A-55634 NIIN 00-472-8679
As Required	Thread, Nylon, Size E	V-T 295 NIIN 00-204-3884
8 Inches	Elastic, 1-Inch	MIL-W-5664 NIIN 00-263-3600
2	Grommet, Size 00	MS20230B20 NIIN 00-291-0302
4	Rivet	MS20426AD4-6 NIIN 00-117-6951
12 Inches	Webbing, Textile, Type IV	MIL-T-5038 NIIN 00-655-5123
1 Yd	Fastener Tape, Hook, 2-Inch	MIL-F-21840 NIIN 00-450-9837
1 Yd	Fastener Tape, Pile, 2-Inch	MIL-F-21840 NIIN 00-405-2265
26	Cap, Snap Fastener	MS27983-1 NIIN 00-891-9073
26	Socket, Snap Fastener	MS27983-2 NIIN 00-893-6243
20	Stud, Snap Fastener	MS27983-3 NIIN 00-276-4908
20	Post, Snap Fastener	MS27983-4 NIIN 00-276-4978

Materials Required (Cont)

Quantity	Description	Reference Number
1 Yd	Fastener Tape, Hook, 1-Inch	MIL-F-21840 NIIN 00-106-5973
1 Yd	Fastener Tape, Pile, 1-Inch	MIL-F-21840 NIIN 00-106-5974
6	Tape, Textile, Nylon, Type III, 1-Inch	92XE-18103-A2B NIIN 00-753-6144
24 Inches	Tape, Textile, Nylon, Type III, 1/2-Inch	MIL-T-5038 NIIN 00-255-7673
22 Inches	Tape, Textile, Nylon, Type III, 1/2-Inch	MIL-T-5038 NIIN 00-255-7673

9-33. Fabrication of CBR Pistol Pocket Snap Fastener Panel (figure 9-9).

NOTE

All stitching shall be in accordance with ASTM-D-6193. Stitches per inch shall be

7 to 10 stitches per inch with 3/4-inch backstitching or overstitching unless otherwise stated. All nylon material will be sear cut. Position all patterns with the warp direction of the fabric. Edge stitching shall be 1/8 inch from edge unless otherwise stated.

1. Place pistol pocket snap fastener panel pattern (figure 9-10) on the nylon fabric, mark a point, sew line edges and cut out the panel. Turn panel over, position snap fastener panel pattern on fabric and mark reinforcement panel location sew lines.

2. Place pistol pocket snap fastener reinforcement panel pattern (figure 9-11) on the Herculite fabric, trace and cut out the reinforcement panel.

3. Lay reinforcement panel fabric onto the snap fastener panel nylon fabric within the sew lines indicated and sew in place.

4. All four sides of the cut edge fabric of the snap fastener panel shall be folded inboard 3/4 inch, covering all raw edges of the reinforcement panel and sew in place.

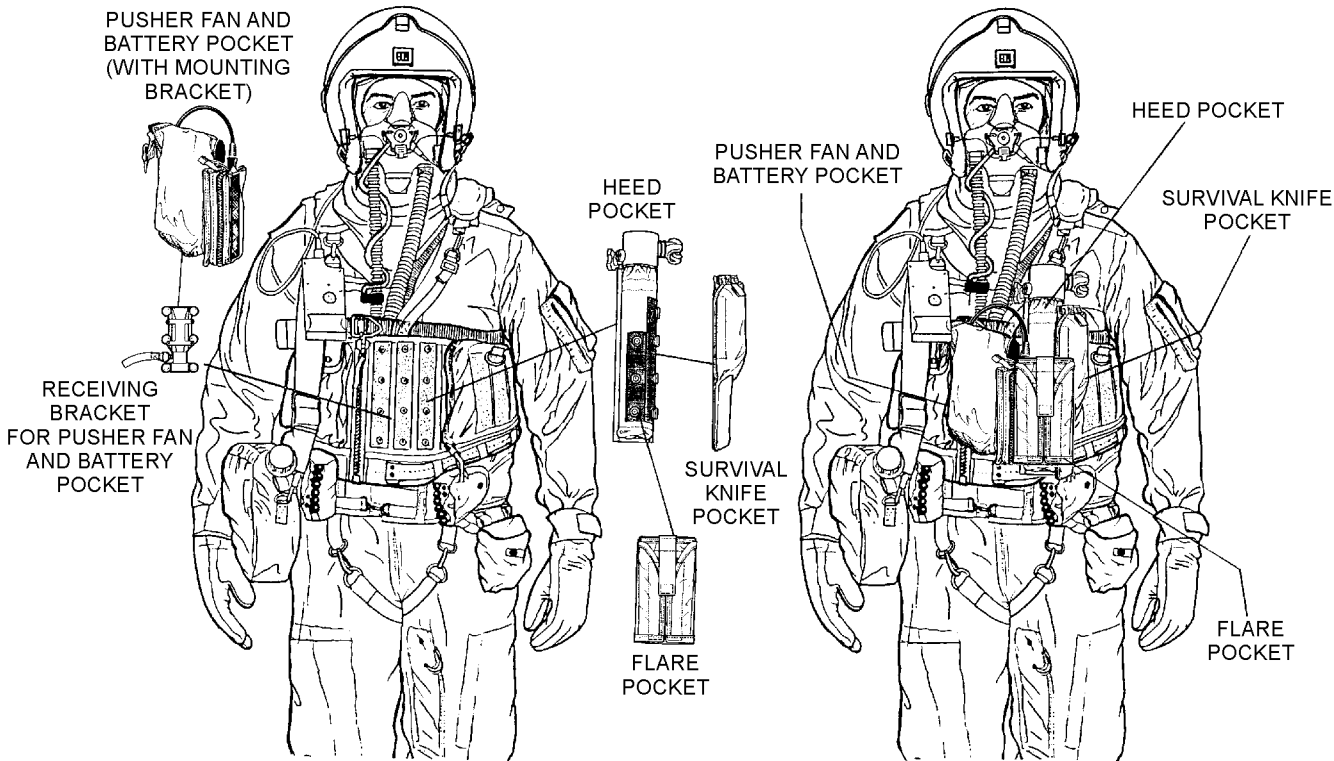


Figure 9-8. CMU-23A/P Survival Vest (CBR Mode)

009008

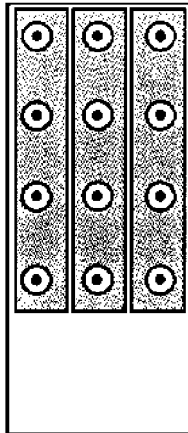


Figure 9-9. CBR Pistol Pocket Snap Fastener Panel

009009

5. With the snap fastener panel nylon side face up, position the reinforcement panel pattern properly on top and mark locations for hook tape placement. Cut three pieces of two-inch hook tape 7 1/2 inches long and sew in place at locations marked.

6. With the two inch hook tape sewn, position reinforcement panel pattern on top of hook tapes, mark the 12 snap locations and punch cut holes for installation of snaps.

NOTE

Install the six snap sockets closest to the top with the lock lug towards the top edge of panel. When positioned, the pull the dot release action will be from the center of

the panel. Install the six remaining snap sockets with the locking lug towards the bottom, so the pull the dot release action from the center will be the opposite direction of the previously installed snaps.

7. Install the 12 sockets (MS27983-2) and caps (MS27983-1) with the sockets on the hook tape side of the pistol pocket snap panel.

8. Refer to ACC 616 for location and sewn placement onto pistol pocket back.

9-34. Fabrication of CBR Vest Snap Fastener Panel (figure 9-12).

NOTE

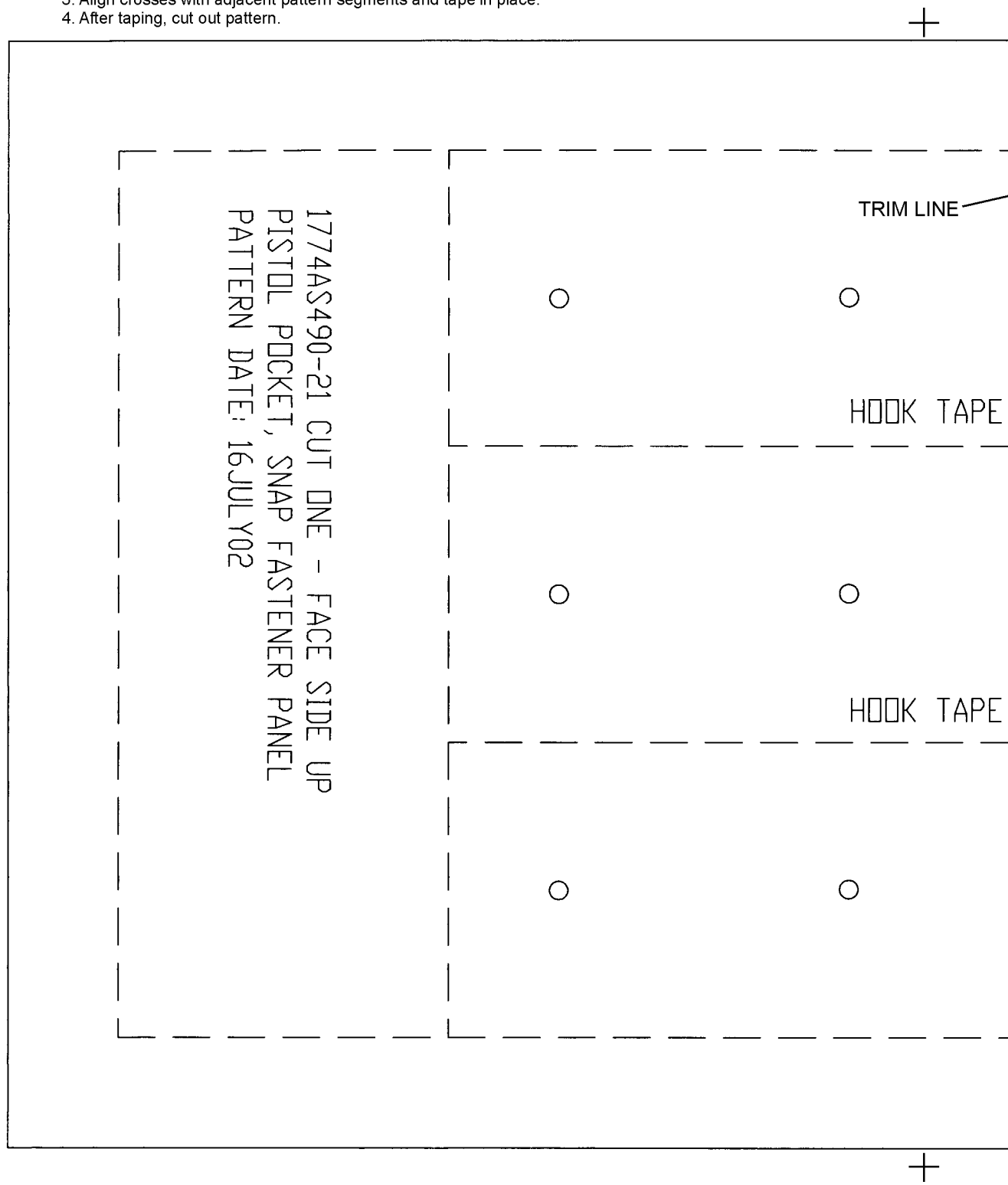
All stitching shall be in accordance with ASTM-D-6193. Stitches per inch shall be 7 to 10 with 3/4-inch backstitching or over stitching unless otherwise stated. All nylon material will be sear cut. Position all patterns with the wrap directions of the fabric. Edge stitching shall be 1/8 inch from edge unless otherwise stated.

1. Place pistol pocket vest snap fastener panel front pattern (figure 9-13) onto nylon fabric, mark all points, sew line edges and cut out the panel. Turn panel over, position snap fastener panel front pattern on fabric, and mark snap fastener panel location sew lines.

2. Place pistol pocket vest snap fastener pattern (figure 9-13) on Herculite fabric, trace and cut out the panel.

NOTE: Procedures for the construction of the pattern.

1. Print out all segments of pattern.
2. Trim all printed segments of pattern at dashed trim line ensuring alignment marks (crosses) remain on the pattern.
3. Align crosses with adjacent pattern segments and tape in place.
4. After taping, cut out pattern.



This figure has been divided into multiple segments to facilitate the printing of the pattern.

Figure 9-10. Pistol Pocket Snap Fastener Panel Pattern (Sheet 1 of 2)

00901001

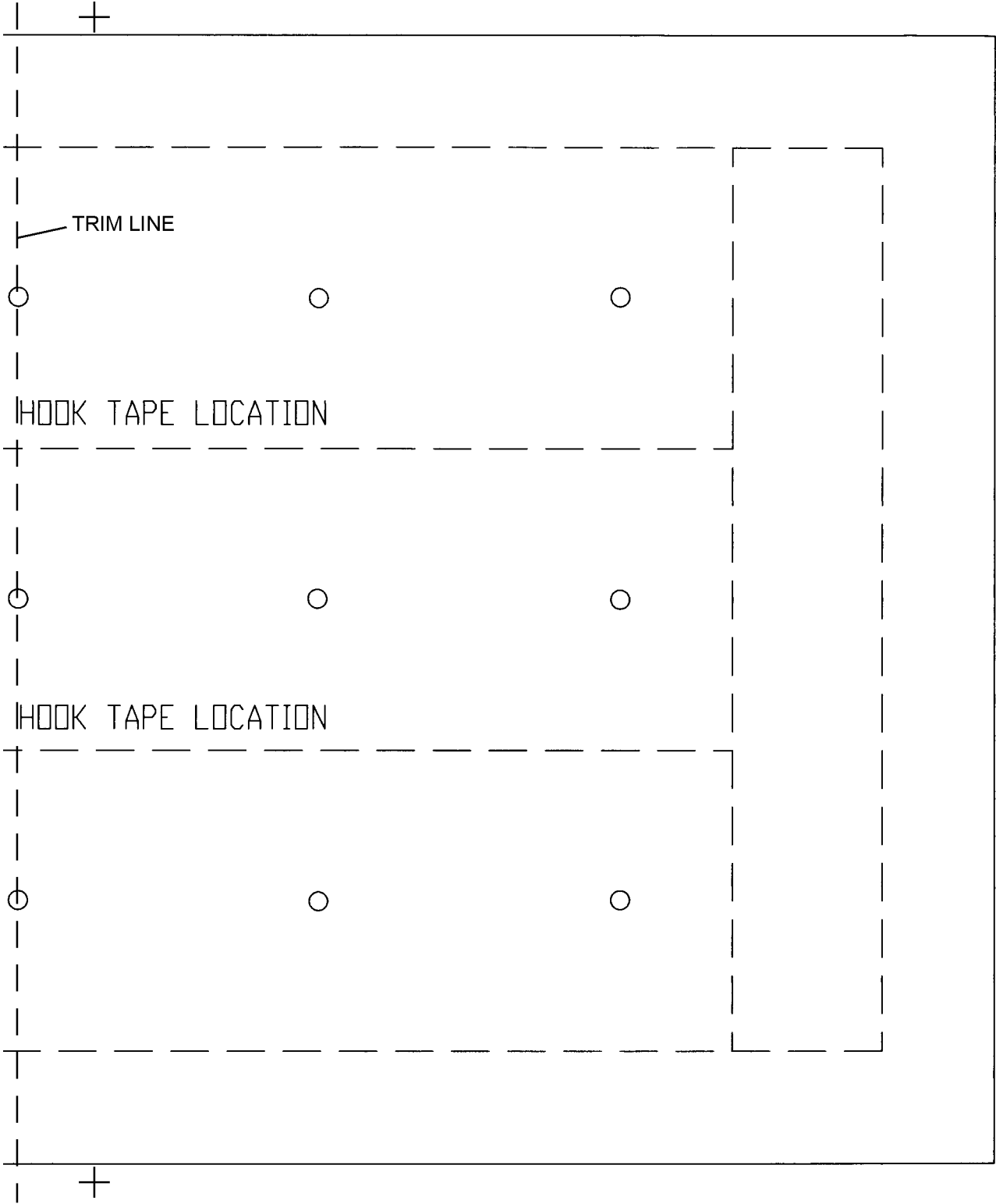
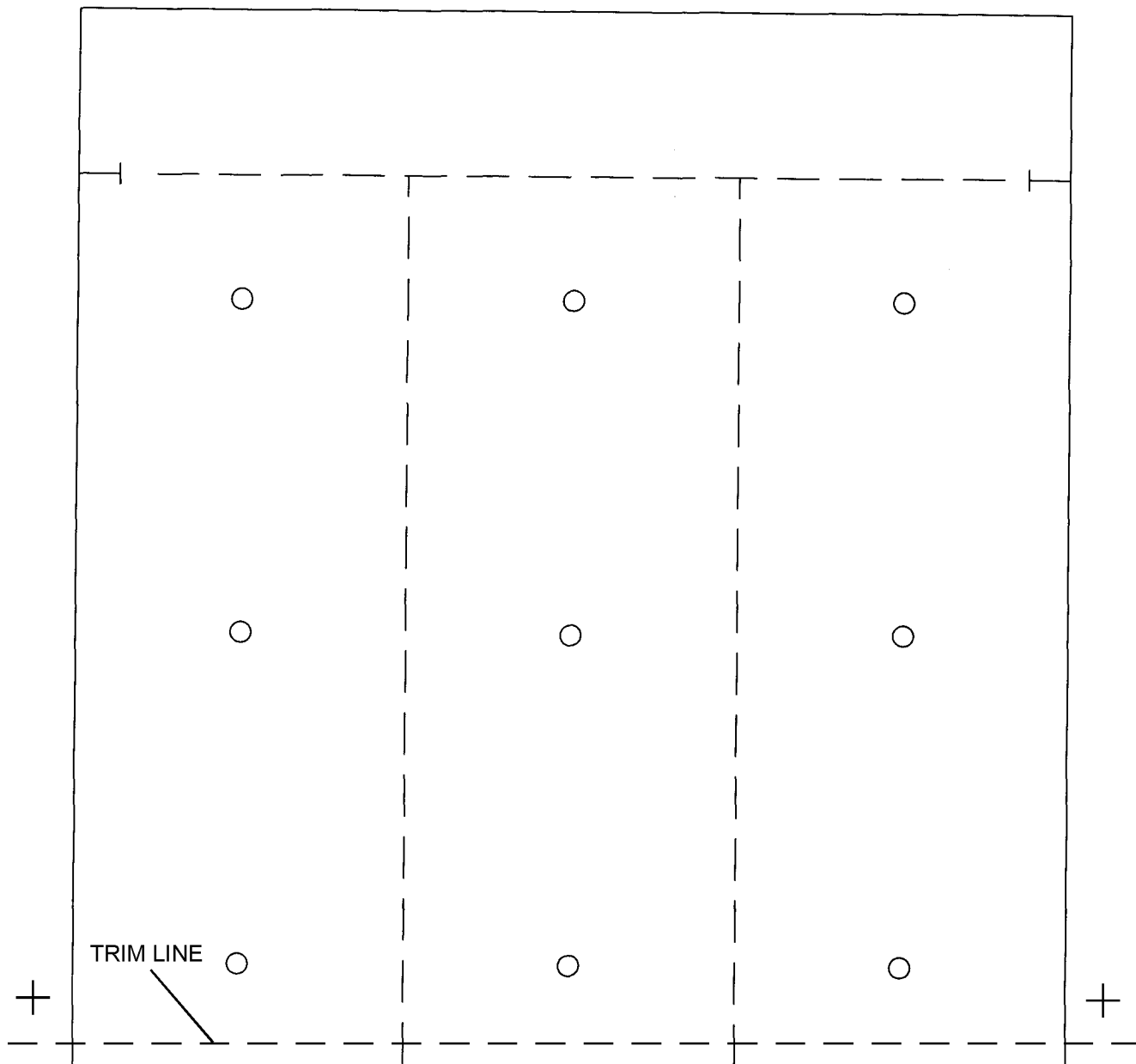


Figure 9-10. Pistol Pocket Snap Fastener Panel Pattern (Sheet 2 of 2)

00901002

NOTE: Procedures for the construction of the pattern.

1. Print out all segments of pattern.
2. Trim all printed segments of pattern at dashed trim line ensuring alignment marks (crosses) remain on the pattern.
3. Align crosses with adjacent pattern segments and tape in place.
4. After taping, cut out pattern.



This figure has been divided into multiple segments to facilitate the printing of the pattern.

Figure 9-11. Pistol Pocket Snap Fastener Reinforcement Panel Pattern (Sheet 1 of 2)

00901101

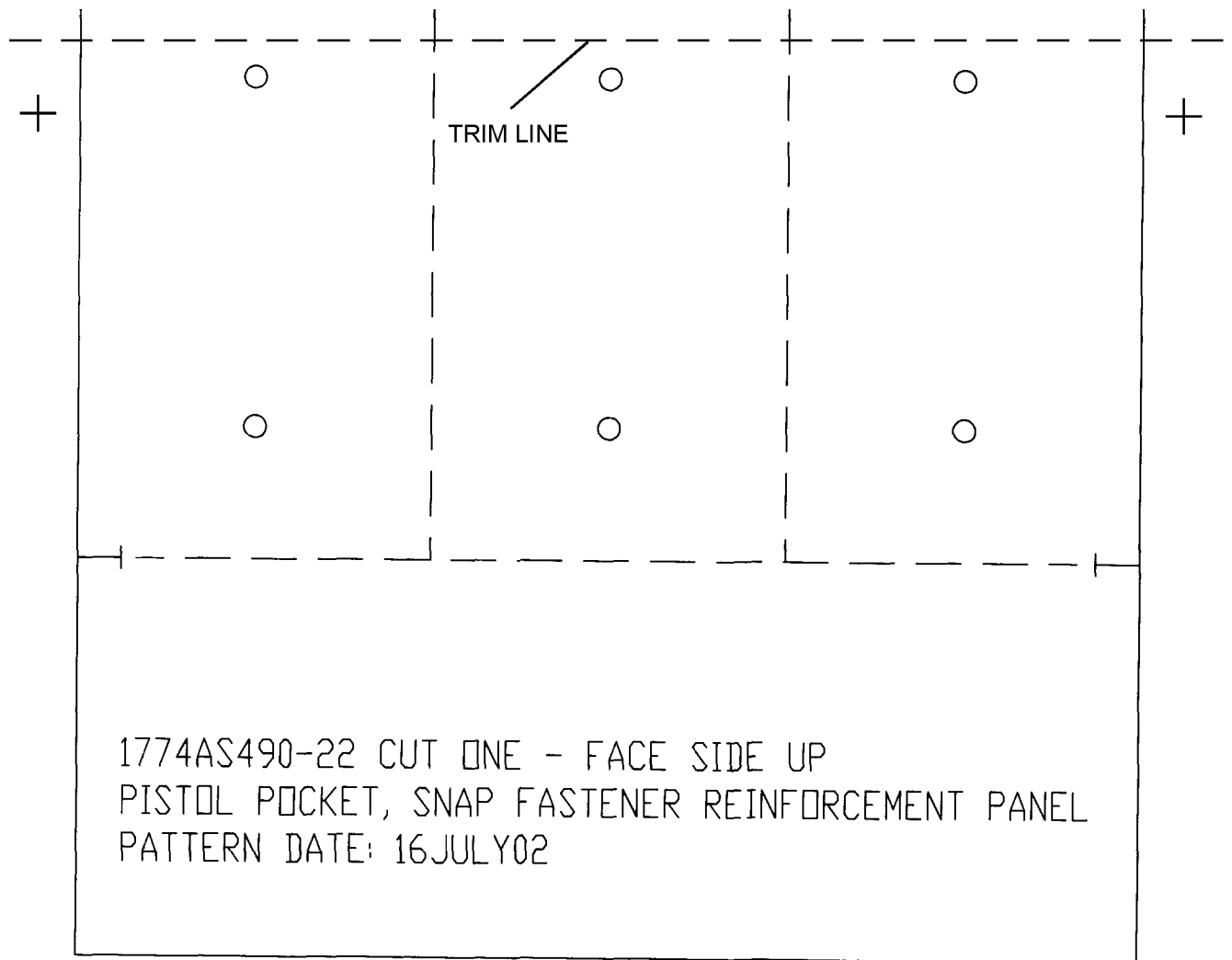


Figure 9-11. Pistol Pocket Snap Fastener Reinforcement Panel Pattern (Sheet 2 of 2)

00901102

NAVAIR 13-1-6.10

3. Lay snap fastener panel fabric onto the snap fastener front panel nylon fabric within the sew lines indicated and sew in place.

4. All four sides of the cut edge fabric of the snap fastener panel front shall be folded inboard 3/4 inch, covering all raw edges of the snap fastener panel and sewn in place.

5. With the snap fastener panel front nylon side face up, position the snap fastener panel pattern on top and mark location for the pile tape placement. Cut three pieces of two-inch pile tape 7 1/2 inches long. While sewing pile tape in place, overlap tape as indicated on snap fastener panel pattern.

6. With the two-inch pile tapes sewn, again position snap fastener panel pattern on top of pile tape, mark the 12 snap locations and punch cut holes for installation of snaps.

7. Install the 12 studs (MS27983-4) and eyelets (MS27983-3) with the studs on the pile tape side of the vest snap fastener panel.

8. Refer to ACC 616 for location and sewn placement on SV-2 vest.

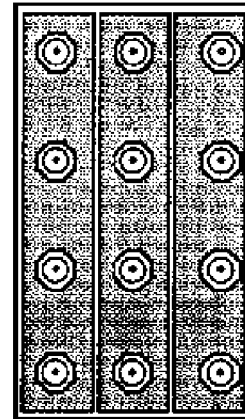
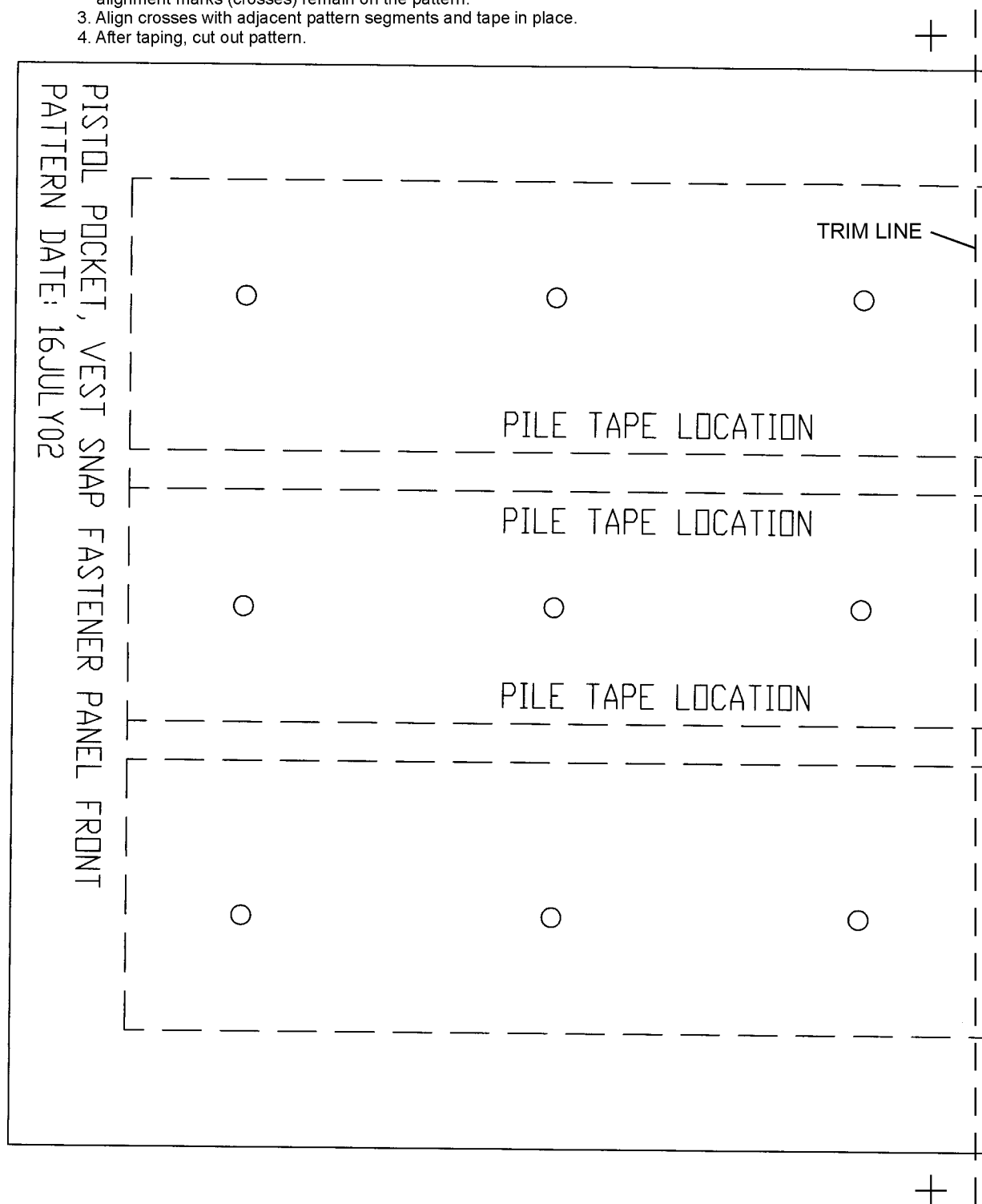


Figure 9-12. CBR Vest Snap Fastener Panel

009012

NOTE: Procedures for the construction of the pattern.

1. Print out all segments of pattern.
2. Trim all printed segments of pattern at dashed trim line ensuring alignment marks (crosses) remain on the pattern.
3. Align crosses with adjacent pattern segments and tape in place.
4. After taping, cut out pattern.



This figure has been divided into multiple segments to facilitate the printing of the pattern.

Figure 9-13. Pistol Pocket Vest Snap Fastener Panel Front Pattern (Sheet 1 of 2)

00901301

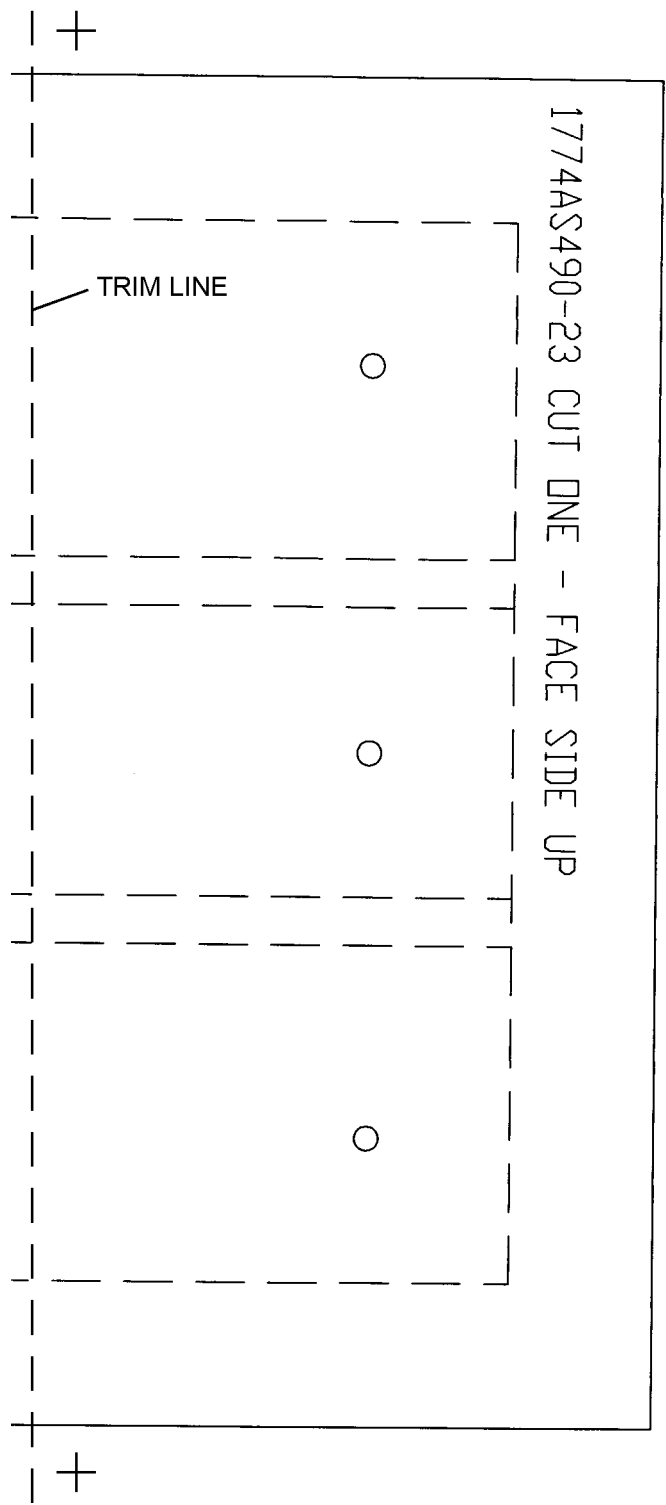


Figure 9-13. Pistol Pocket Vest Snap Fastener Panel Front Pattern (Sheet 2 of 2)

00901302

CHAPTER 10

CMU-29(V)2/P CBR OVERVEST

Section 10-1. Description

10-1. GENERAL.

10-2. The CMU-29(V)2/P CBR Overvest is used to store the pusher fan and filter canister when the A/P22P-14(V)2 thru (V)4 variant Chemical, Biological, and Radiological (CBR) Respirator Assemblies are worn by fixed wing aircrews. The three respirator assembly variants are configured as the A/P22P-14(V)2, Tactical LOX; A/P22P-14(V)3, OBOGS; and A/P22P-14(V)4, Panel Mounted Oxygen Regulator. Each variant consists of the CBR Mask and Lower Assembly. The Lower Assembly consists of an H-manifold, lower hoses (for delivering both air and oxygen), pusher fan subassembly, and C2A1 canister with appropriate plumbing to connect to either LOX, OBOGS, or Panel Mounted oxygen delivery systems.

10-3. CONFIGURATION.

10-4. The CMU-29(V)2/P Overvest is constructed primarily of nylon mesh, nylon straps and nylon cloth. Adjustable shoulder and waist straps along with a front slide fastener provide a means of fitting and securing the vest to the aircrew. Pockets are provided for stowage of pusher fan and filter canister, battery, flashlight, hook blade knife and oxygen regulator. The chest-mounted oxygen regulators shall be located inside a pocket secured to the vest by means of both slide fasteners and hook and pile tape. The pusher fan and filter canister and the survival item pockets are shown in figure 10-1. An inset for a view-out of the vest panel and straps are shown in figure 10-2. The CRU-79 Oxygen Regulator pocket is shown in figure 10-3, and the CRU-82/P, CRU-88/P and CRU-103/P Oxygen Regulator pocket are shown in figure 10-4. The Panel Mounted regulator configuration

does not use a pocket on the Overvest for the oxygen hose going to the regulator.

10-5. DRAWING INDEX.

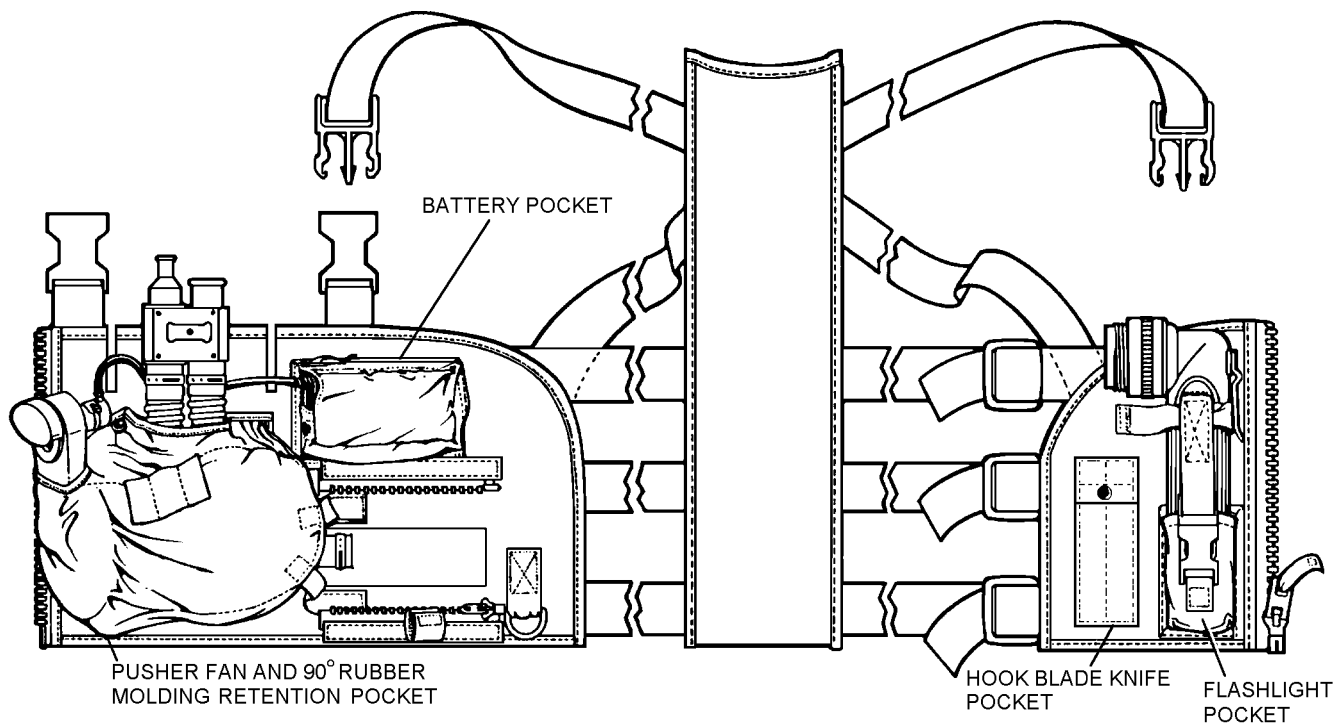
10-6. Table 10-1 indicates the drawing number and nomenclature for the CBR Overvest and components.

Table 10-1. CMU-29(V)2/P CBR Overvest Drawings Index

Drawing Number	Nomenclature or Description
3298AS300	Vest Assembly
3298AS320	CRU-79/P Oxygen Regulator Pocket
3298AS330	CRU-82/P, CRU-88/P or CRU-103/P Oxygen Regulator Pocket

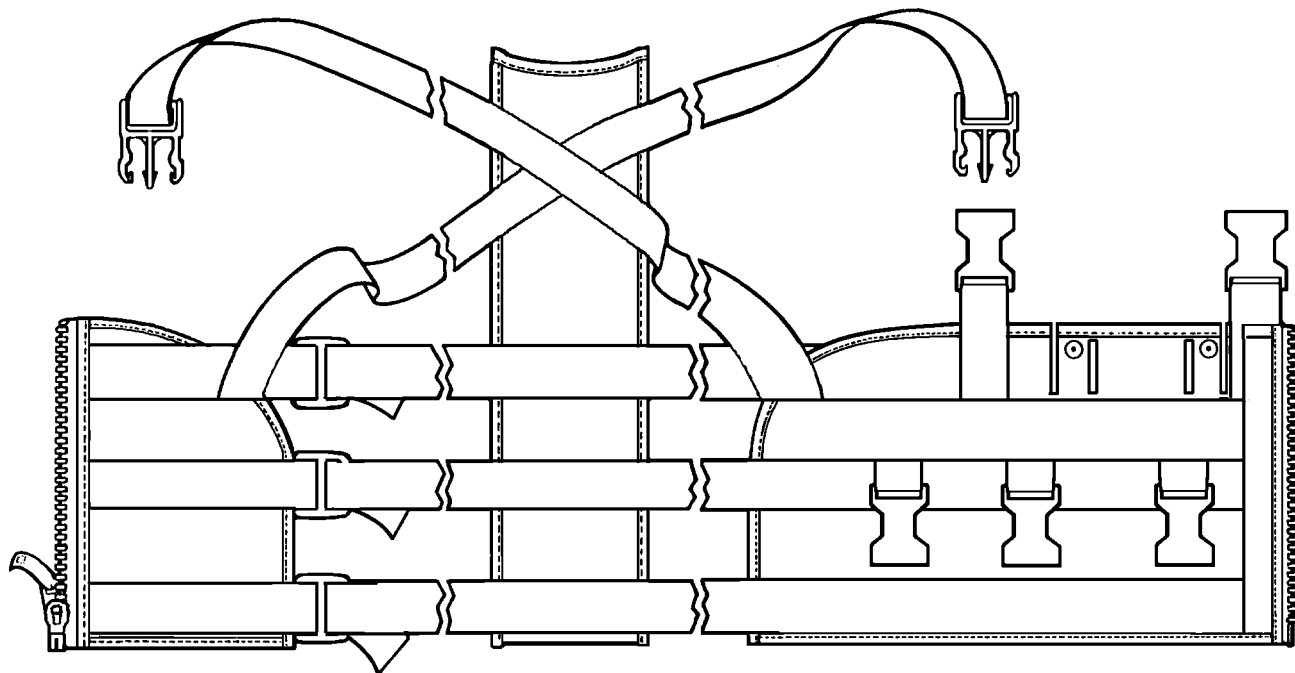
10-7. APPLICATION.

10-8. The CMU-29(V)2/P Overvest is designed for fixed wing aircrews when the A/P22P-14(V)2 thru (V)4 CBR Respirator Assembly variants are required to be worn. The CBR Overvest is worn over either the SV-2B Survival Vest, CMU-33/P Survival Vest, or the ACC 380 Integrated Torso Harness to stow the CBR Respirator Assembly pusher fan and filter canister and various survival items. The illustrations and procedures contained in Chapter 4, should be used in conjunction with the illustrations and procedures in this chapter to properly integrate the A/P22P-14(V)2 through (V)4 CBR Respirator Assemblies with the CMU-29(V)2/P CBR Overvest. The specific equipment worn by each aircrewmember is specified in the NAVAIR 13-1-6 Series Aviation-Crew Systems manuals.



010001

Figure 10-1. CMU-29(V)2/P CBR Overvest



010002

Figure 10-2. CMU-29(V)2/P CBR Overvest, Interior View

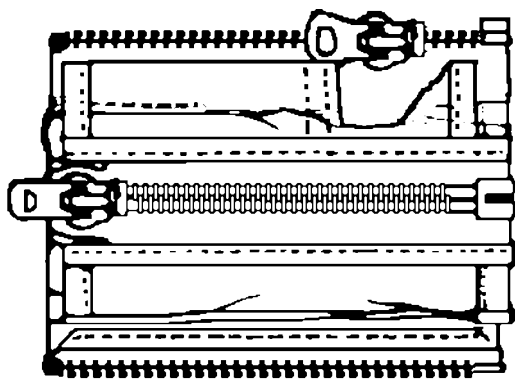


Figure 10-3. CRU-79/P Oxygen Regulator Pocket, P/N 3298AS320-1

010003

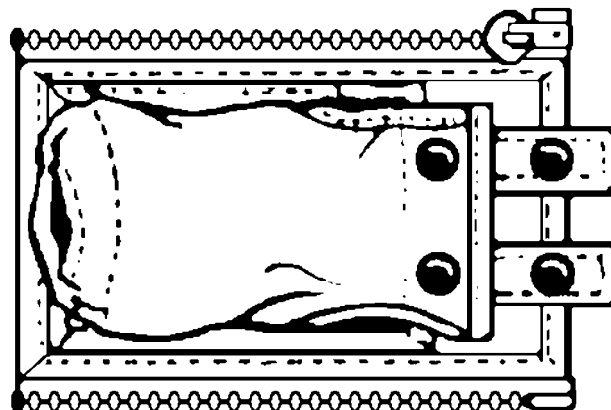


Figure 10-4. CRU-82/P, CRU-88/P, and CRU-103/P Oxygen Regulator Pocket, P/N 3298AS330-1

010004

Section 10-2. Modifications

10-9. GENERAL.

10-10. The only modification authorized for the CMU-29(V)2/P Overvest at this time is modification for C-20/C-40 crew chief configuration.

10-11. MODIFICATION OF THE CMU-29 OVERVEST FOR C-20/C-40 CREW CHIEF CONFIGURATION. To modify the CMU-29 Overvest, proceed as follows:

1. Lay out vest with pusher fan pocket facing up.
2. Carefully remove top slide fastener chain for the regulator panel attachment on the vest and carefully remove battery pocket.

NOTE

Ensure snap stud is clear of pocket when sewing in place.

3. Place battery pocket (move pocket to top edge of vest) as shown in Figure 10-5, 6 1/2 inches from the slide fastener - vest edge tape. Sew battery

pocket in place using 2 rows of stitching 1/8 inch and 1/4 inch from edge.

4. Identify CRU-103/P pocket P/N 3298AS330-1 and carefully remove both slide fastener chains from regulator panel.

5. Position regulator panel on the vest panel so that it is below the battery pocket with the oxygen outlet hose opening facing the pusher fan pocket.

6. Measure 3 3/4 inches up from bottom edge of vest and place a mark for the lower right corner of the regulator panel touching the edge tape of the vest next to the horizontal straps.

7. Measure 1 3/4 inches up from bottom edge of vest and place a mark for the lower left corner of the regulator panel.

8. Once pocket is in place on the vest as shown in Figure 10-5, sew the slide fastener sides of pocket panel in place using two rows of stitches side by side 1/8 inch from edge. Using the cross stitching of regulator pocket flap as a guide, sew the center of panel in place using one row of stitches and backstitch 3/4 inch minimum on each side.

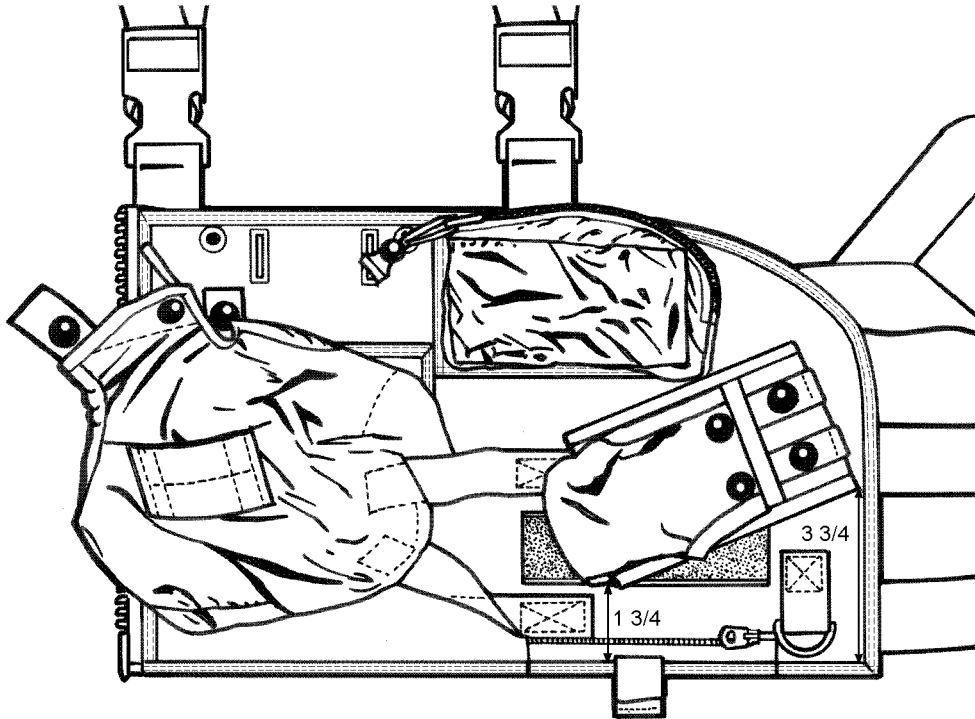


Figure 10-5. Modification for C-20/C-40 Crew Chief Configuration

010005

Section 10-3. Installation

10-12. GENERAL.

10-13. This section contains installation procedures for A/P22P-14(V)2 thru (V)4 Respirator Assemblies; CRU-79/P Oxygen Regulator; CRU-82/P, CRU-88/P, or CRU-103/P Oxygen Regulator; Flashlight and Hook Blade Knife.

10-14. INSTALLATION OF A/P22P-14(V)2 THRU (V)4 CBR RESPIRATOR ASSEMBLIES. For installation of the A/P22P-14(V)2 thru (V)4 CBR Respirator Assemblies into the CMU-29(V)2/P CBR Overvest, proceed as follows:

NOTE

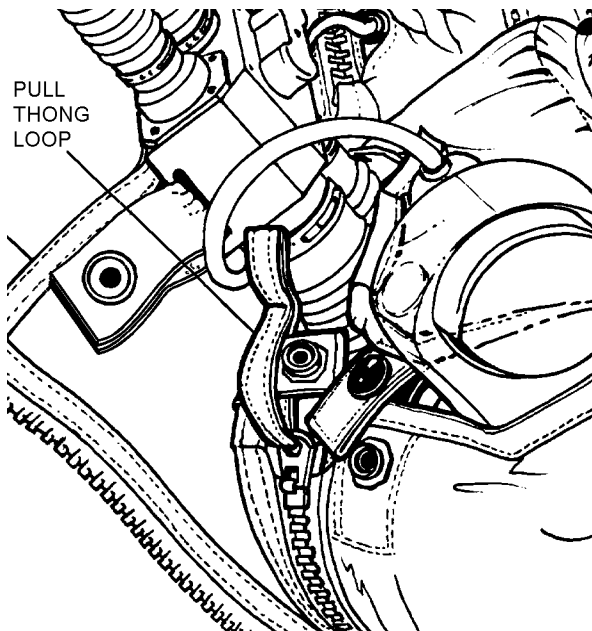
Refer to Chapter 4 for the configuration of the lower assembly, to include the pusher

fan, filter canister, oxygen regulator and oxygen regulator hose for the A/P22P-14(V)2 through (V)4 variants.

1. Place the vest on a clean dry surface with the larger panel, bearing the canister and battery pockets, facing up and the slide fastener on the left.

2. Stow the 90° rubber molding into the retention pocket. Route the regulator hose or connector through the small hole in the retention pocket. Stow the pusher fan subassembly in the retention pocket. Ensure the cable tie is connected directly below the neck of the pusher fan.

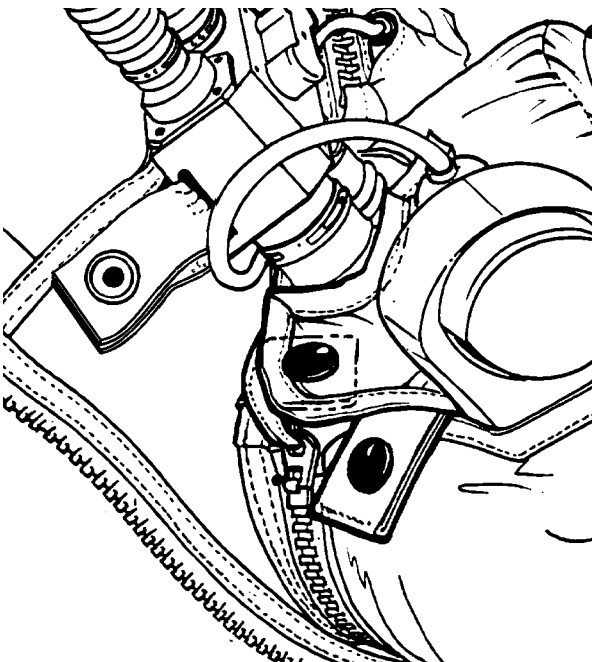
3. Close the pocket slide fastener and insert the tab bearing a snap fastener stud through the loop in the slide pull thong.



Step 3 - Para 10-14

10p14s3

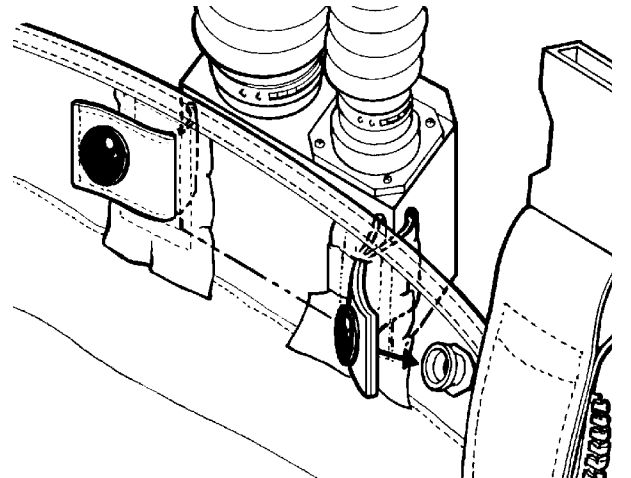
4. Secure in place with the snap fastener socket set in the pocket fabric. Secure the remaining snap fastener.



Step 4 - Para 10-14

10p14s4

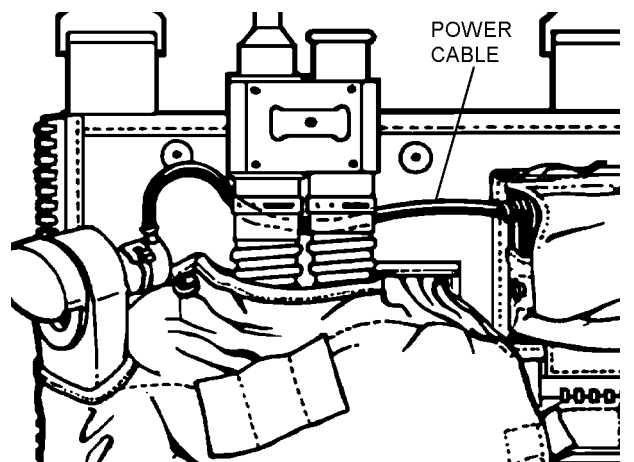
5. Reeve the snap fastener tabs on the H-manifold through the slots in the overvest and mate them to the snap fastener studs on the other side of the panel.



Step 5 - Para 10-14

10p14s5

6. Route the pusher fan power cable under the H-manifold hoses toward the battery pocket. Plug the power cable into a battery, stow and secure the battery in the pocket.



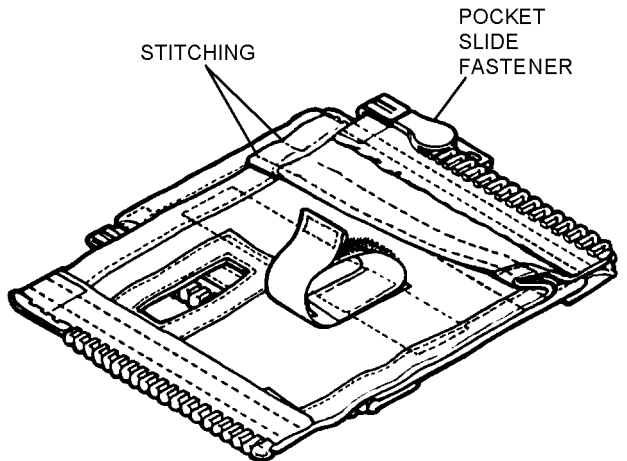
Step 6 - Para 10-14

10p14s6

10-15. INSTALLATION OF CRU-79/P OXYGEN REGULATOR. To install the CRU-79/P oxygen regulator, proceed as follows:

NAVAIR 13-1-6.10

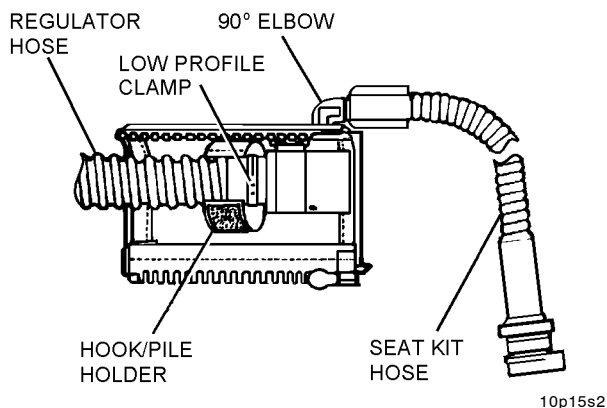
1. To accommodate the larger CRU-79/P Regulator, cut the rows of stitching on the regulator pocket interior closest to the slider and unfold.



Step 1 - Para 10-15

10p15s1

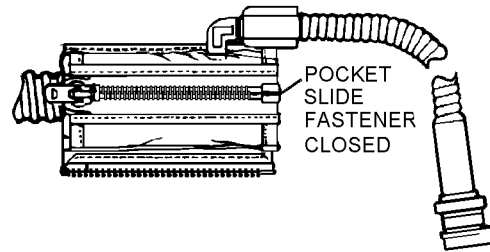
2. To install the CRU-79/P regulator in its pocket, pass the seat kit hose quick-disconnect through the inside rectangular opening. Pull the hose through the opening until the communications connector and 90° elbow are on the outside. Attach the regulator to the hose using the appropriate low profile clamp.



Step 2 - Para 10-15

10p15s2

3. Secure the hook and pile tape around the regulator outlet, then close the slide fastener.

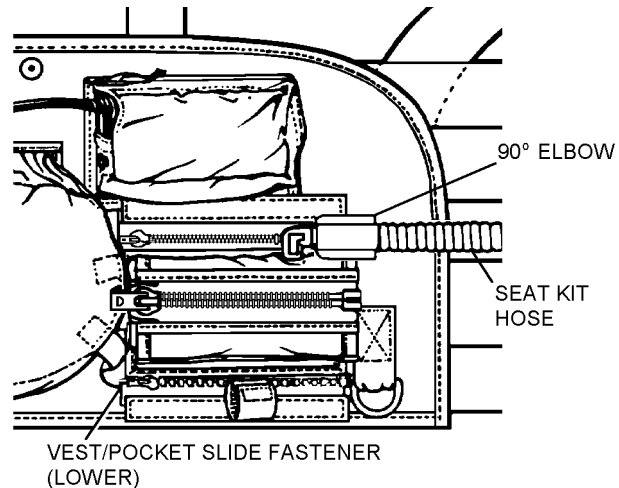


10p15s3

Step 3 - Para 10-15

4. Secure the regulator pocket to the vest by engaging the slide fasteners on the vest and pocket.

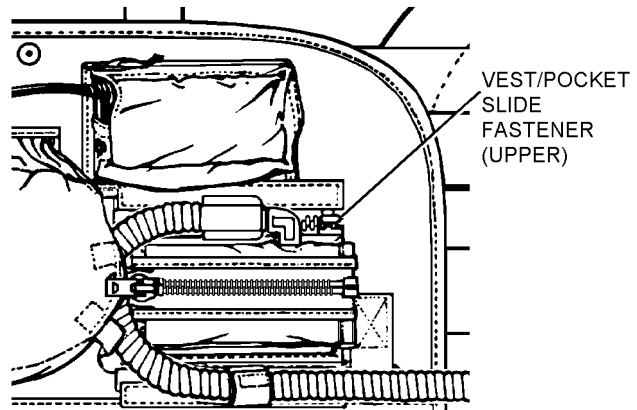
5. Orient the oxygen hose and leave it free as shown.



10p15s5

Step 5 - Para 10-15

6. To accommodate an individual with a shorter torso, it may be necessary to route the regulator hose under the retention pocket snaps.

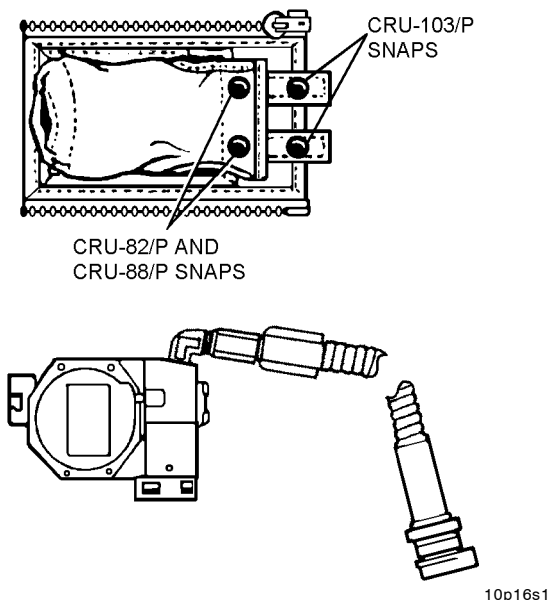


10p15s6

Step 6 - Para 10-15

10-16. INSTALLATION OF CRU-82/P, CRU-88/P OR CRU-103/P OXYGEN REGULATOR. To install the CRU-82/P, CRU-88/P or CRU-103/P oxygen regulator, proceed as follows:

1. Lay out the regulator pocket with the circular opening for the regulator outlet on the left, the snap fastener pull tabs on the right, and the hook fastener facing down.



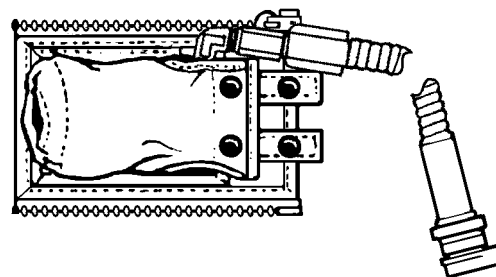
Step 1 - Para 10-16

2. Attach the 90° elbow to the seat pan oxygen hose and the regulator.

NOTE

For the CRU-82/P and CRU-88/P Regulators, use the 90° elbow that comes with the CBR Respirator Assembly. For the CRU-103 Regulator OBOGS application, use the 90° elbow that comes with the Respirator Assembly. For the 103/P Regulator LOX application, use the 90° elbow that is removed from the CRU-79/P.

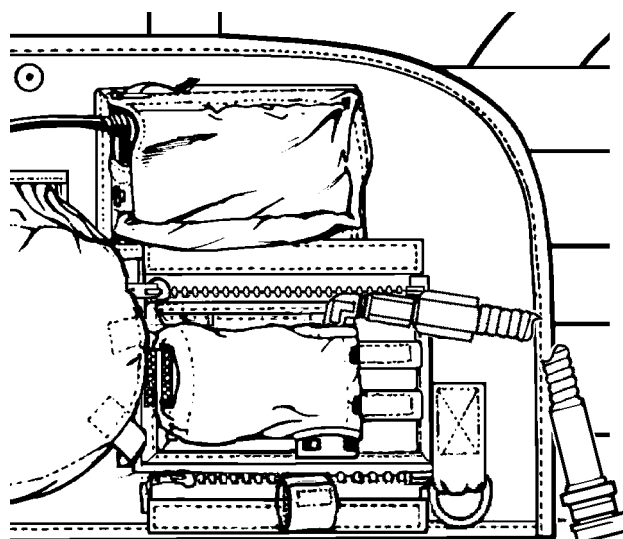
3. Insert the CRU-82/P, CRU-88/P or CRU-103/P regulator into the pocket outlet end first, and with the identification plate facing up. Ensure that the outlet extends through the opening completely, exposing the slots for engaging the pins on the MS27796 connector. Engage the snap fastener and hook and pile closures.



10p16s3

Step 3 - Para 10-16

4. Attach the regulator pocket to the vest by means of the slide fasteners. Orient the oxygen hose and leave it free as shown.



10p16s4

Step 4 - Para 10-16

5. Connect the CRU-82/P, CRU-88/P, or the CRU-103 Regulator to the 3-Pin Bayonet Connector.

10-17. INSTALLATION OF FLASHLIGHT AND HOOK BLADE KNIFE. To install the flashlight into CMU-29(V)2/P CBR Overvest, proceed as follows:

1. Insert a cable tie, of adequate length, through the flashlight retention strap.

2. Route cable tie around the neck of the flashlight and underneath the metal clip.

3. Insert flashlight through vest strap into flashlight pocket and secure with the plastic buckle. Position flashlight with lens pointed outward.

4. Remove hook blade knife from the survival vest or harness, as applicable, and install in the overvest hook blade knife pocket. Tether the knife to the grommet on the overvest knife pocket.

Section 10-4. Fitting

10-18. GENERAL.

10-19. The CMU-29(V)2/P CBR Overvest comes in one size and is designed to fit all aircrewmember sizes by adjusting the shoulder straps and waist straps as required to fit each individual. To fit the CBR Overvest, proceed as follows:

NOTE

For proper fit, adjustments must be made in both standing and sitting positions.

1. Don all normal flight equipment and ensure the torso harness and survival vest have been properly fitted to the individual aircrewmember.

2. Fit and integrate CMU-29(V)2/P CBR Overvest to the survival vest and life preserver unit.

NOTE

The A/P22P-14(V)2 or (V)3 Respirator Assemblies shall be installed into the CMU-29(V)2/P overvest in accordance with [paragraph 10-14](#) prior to performing following steps.

The flight suit, torso harness and BTN clothing shall be donned in accordance with [Chapter 5A](#), prior to performing the following steps.

a. If using CMU-33/P, Type II vest, first remove radio pocket.

b. Don survival vest and life preserver in accordance with NAVAIR 13-1-6.7-2 or NAVAIR 13-1-6.7-4.

c. Don A/P22P-14(V)2 or (V)3 Respirator Assembly. Ensure Pusher Fan is turned on. Refer to [Chapter 4](#) for proper fitting procedures.

d. Don CMU-29(V)2/P Overvest. Position it to permit unrestricted head rotation and to eliminate cockpit controls interference.

NOTE

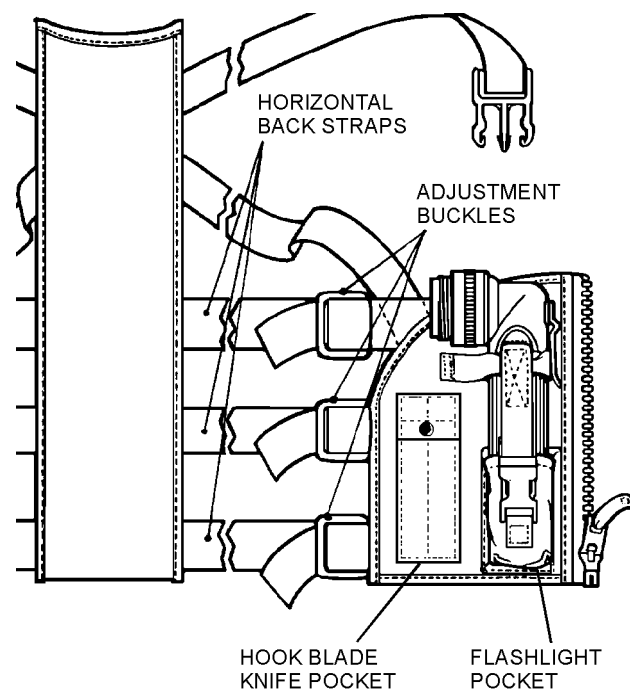
If using LPU-36/P, route tie downs through clearance slots on CMU-29(V)2/P Overvest.

e. Install CMU-29(V)2/P Overvest windblast retention straps ([figure 10-6](#)). For use with CMU-33/P vest, position straps on loops of CMU-33/P vest to ensure alignment for an in-line pull. Connect both halves of retention strap. For use without CMU-33/P, secure windblast retention straps directly to torso harness D-rings. Adjust straps for slight tension.

f. Route excess strap through tri-lock and secure by tacking using waxed 6 cord 1 turn double. Ensure tacking passes through all straps and around tri-lock center bar. Tie off tacking using a surgeon's knot followed by a square knot ([figure 10-6](#)).

g. If using CMU-33/P, Type II vest, reinstall radio pocket on CMU-33/P vest. Ensure one windblast retention strap is located behind radio and is accessible for doffing.

3. With the overvest ideally positioned, adjust the shoulder straps and waist straps for a snug but comfortable fit.



Step 3 - Para 10-19

10p19s3

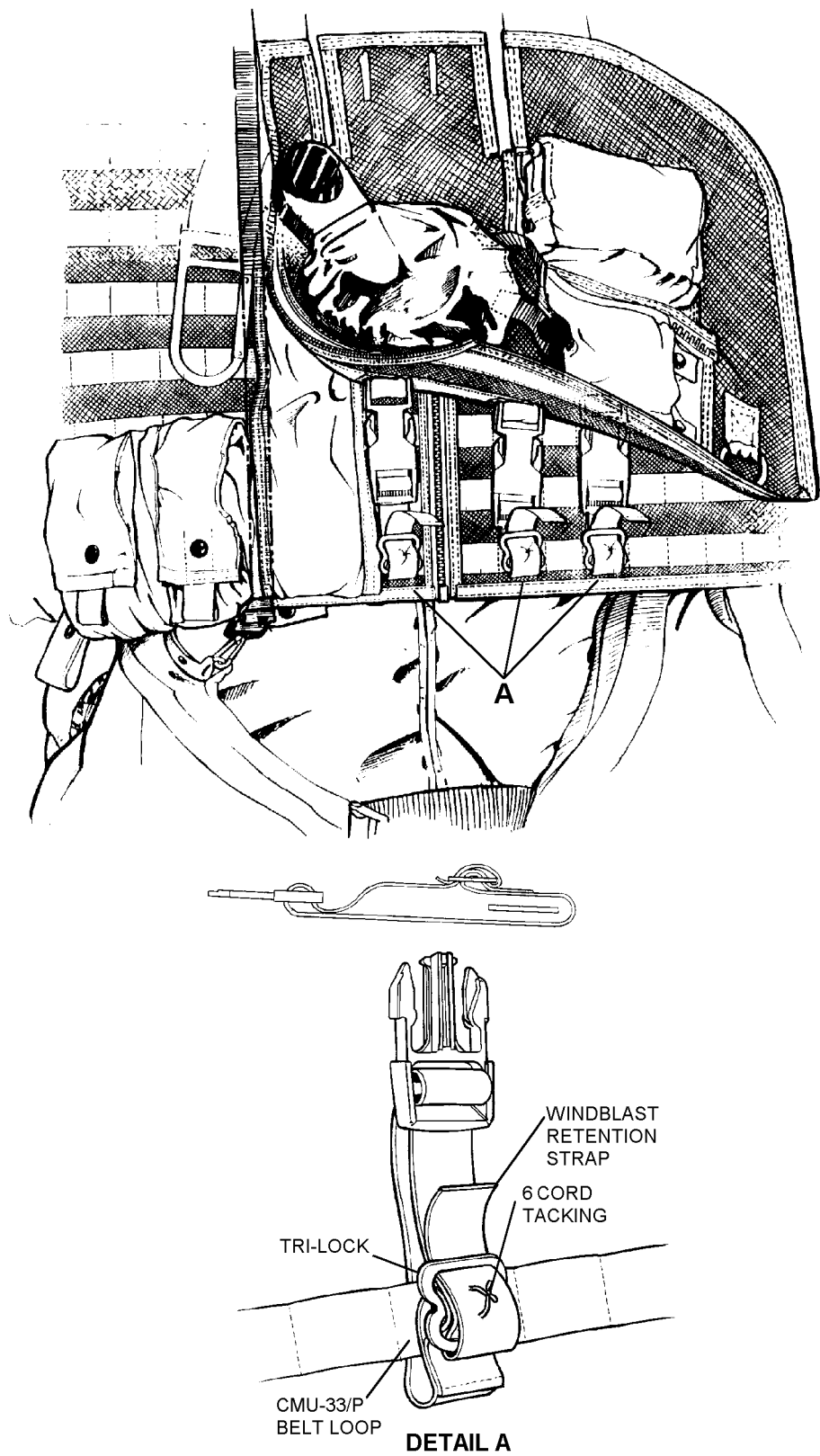
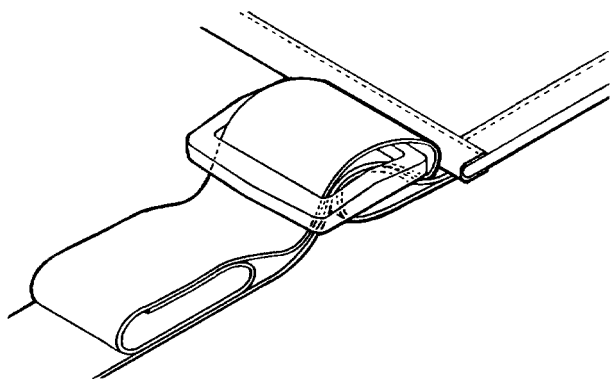


Figure 10-6. CMU-29(V)2/P Overvest Integration with CMU-33/P Vest and Torso Harness

010006

4. After adjusting the horizontal back straps, reeve the free end of the straps back through the friction adapter.



Step 4 - Para 10-19

10p19s4

5. Using a nonpermanent marker, such as tailors' chalk, make reference marks on the straps to mark their position in case the straps loosen while the aircrewmember is doffing the vest.

6. After the aircrewmember has doffed the vest, verify the position of the straps relative to the marks made in the previous step and adjust as necessary.

7. Tack all straps with one turn of waxed nylon 6 cord, single, passing the 6 cord through the webbing and around the crossbar of the friction adapter. Tie off using a surgeon's knot followed by a square knot. Sear the ends or use an overhand binder knot.

8. Fold the free ends of the straps over in 1 1/2 to 2 inch folds and tack down with one turn of waxed nylon 6 cord, single. Tie off using a surgeon's knot followed by a square knot. Sear the ends or use an overhand binder knot.

Section 10-5. Maintenance

10-20. GENERAL.

10-21. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be recorded on the appropriate form in accordance with OPNAVINST 4790.2 Series.

10-22. PLACE-IN-SERVICE AND SPECIAL INSPECTION. The Place-In-Service and Special Inspections are visual inspections to be performed at O-level or above in accordance with paragraph 10-23. The inspection shall be performed prior to placing the overvest in service and every 90 days thereafter. The 90-day Special Inspection may be waved when the vest is being stored for extended periods of time under controlled conditions. However, an inspection shall be required prior to use after storage.

10-23. Visual Inspection. The visual inspection of the CMU-29/P(V)2/P CBR Overvest shall be performed as follows:

- 1. Visually inspect survival items in accordance with the applicable chapter of NAVAIR 13-1-6.5.
- 2. Inspect cloth and webbing for cuts, tears, fraying and contamination.
- 3. Inspect stitching for security.

4. Inspect hook and pile tape for damage and security.

5. Inspect slide fasteners for damage, security, and ease of operation. Inspect thong pull tabs for presence and security of attachment.

6. Inspect hardware for security, corrosion, dents, burrs, distortion, sharp edges and ease of operation, as applicable.

7. If cleaning is necessary, proceed to paragraph 10-24.

8. Ensure all discrepancies have been corrected.

9. Repack survival items as required.

10. Record inspection date and signature of inspector in accordance with OPNAVINST 4790.2 Series.

10-24. CLEANING. To clean vest, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Laundry Detergent	Commercial

1. Remove all CBR components and survival items.

2. Mix proper strength solution of detergent using manufacturer’s instructions.



3. Immerse overvest in solution and allow to soak for five minutes. Agitate gently for two minutes. Drain, but do not wring out vest material.

Do not use clothes dryer or hang in direct sunlight.

5. Hang overvest by shoulder straps to air dry.

4. Rinse in cool, clean water until all traces of detergent are gone.

10-25. REPAIRS AND REPLACEMENTS. Repairs and replacements will be performed at O-Level or above. Table 10-2 lists the common repairs and replacements to maintain serviceability.

Table 10-2. Repair/Replacement

Description of Repair or Replacement	Paragraph Number
Replacement of loose or broken stitching	Not 1
Repair of small holes or tears	Not 1
Replacement of hook and pile fastener tapes	Not 2
Replacement of snap fasteners	Not 3
<p>Notes: 1. Broken or loose stitching shall be repaired by restitching using stitching Type 301, 8 to 10 stitches per inch, with thread conforming to MIL-T-83193, size E, sage green (NIIN 00-130-6245) or V-T-295, size E, sage green (NIIN 00-204-3884). Backstitch 1/2 inch on all ends of stitching.</p> <p>2. Worn or damaged hook and pile fastener tapes may be repaired using the same type and length of fastener tape. Remove damaged tape and stitch new tape in position of original tape, using a single row of stitching 1/8 inch from all edges, stitch Type 301, 8 to 10 stitches per inch, with thread conforming to V-T-295, size E, sage green (NIIN 00-204-3884). Hook and pile tape on vest is 1 or 1 1/2 inches wide.</p> <p>3. Broken or missing snap fastening devices may be repaired using the same type of snap fastener. Refer to the applicable paragraph to determine the correct choice. Remove broken snap, if applicable, and attach new stud and eyelet in original position. Snap fasteners on either side of the slide fastener should be reinforced with a 14 x 1-inch strip of MIL-T-5038, Type III, nylon tape sewn on the backside.</p>	

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